

***Bibliography on***  
**COLD REGIONS**  
**SCIENCE AND TECHNOLOGY**

**VOLUME 53, PART 1, 1999**

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**COLD REGIONS**  
**SCIENCE AND TECHNOLOGY**

**VOLUME 53, PART 1**

**R.W. Goldblatt and C. Minkus, Editors**

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**Volume 53, Part 1**

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*Roberta W. Goldblatt*  
*Carl Minkus*  
*Cold Regions Bibliography Project*  
*Federal Research Division*  
*Library of Congress*

53-1

Observation of stratospheric trace gases over Ny-Alesund, Spitsbergen, using a groundbased microwave-radiometer. [Messung stratosphärischer Spurengase über Ny-Alesund, Spitzbergen, mit Hilfe eines bodengebundenen Mikrowellen-Radiometers]

Raffalski, U., *Berichte zur Polarforschung*, 1998, No.278, 106p., In German with English summary. Refs. p.101-106.

Atmospheric composition, Ozone, Chemical properties, Radiation measuring instruments, Norway—Spitsbergen

53-2

Implication of the northeast water polynya on the sedimentation by NE-Greenland and Late-Quaternary paleo-oceanic investigations. [Die Auswirkungen der "NorthEastWater"-Polynya auf die Sedimentation vor NO-Grönland und Untersuchungen zur Paläo-Ozeanographie seit dem Mittelweichsel]

Notholt, H., *Berichte zur Polarforschung*, 1998, No.275, 183p., In German with English summary. Refs. p.171-182.

Polynyas, Sediments, Chemical composition, Geochemistry, Carbon isotopes, Greenland Sea

53-3

"Coordinated program of antarctic research." Abstracts of colloquium reports on the topic "Antarctic research compared with similar investigations in Arctic ice regions". ["Koordiniertes Programm Antarktisforschung." Berichtskolloquium im Rahmen des Koordinierten Programms "Antarktisforschung mit vergleichenden Untersuchungen in arktischen Eisgebieten"]

Miller, H., ed, *Berichte zur Polarforschung*, 1998, No.277, 124p., Predominantly in German with some reports in English. Refs. passim.

Meetings, Research projects

53-4

Operational parameters for mechanical freezing of alum sludge.

Martel, C.J., Affleck, R.T., Yushak, M., *MP 5218, Water research*, 1998, 32(9), p.2646-2654, 12 refs.

Ice physics, Sewage treatment, Waste treatment, Sludges, Freeze thaw cycles, Ice crystal growth, Ice solid interface, Particles, Grain size, Freezing rate, Mechanical tests, Equipment, Cost analysis

Freezing tests were conducted with alum sludge that had been dewatered to a solids content typically produced by a gravity thickener, vacuum filter and belt press. These sludges were then frozen at various rates in thin layers to simulate a horizontal belt freezer. The tests indicate that a low freezing rate and a high initial solids content produce larger alum sludge particles. Curing time has no effect on grain size. The maximum freezing rates for the gravity-thickened, vacuum-filtered and belt-pressed sludges were 6.6, 15.5 and 19.8 kg/h/m<sup>2</sup>, respectively. The electrical cost of freezing sludge with this device was estimated to be \$0.004/m<sup>3</sup>. These tests show that dewatering prior to freezing not only saves energy because it reduces the amount of sludge to be frozen, but it improves the final product in terms of a larger effective grain size.

53-5

CO...H<sub>2</sub>O bonding in and on porous ices.

Givan, A., Loewenschuss, A., Nielsen, C.J., *Vibrational spectroscopy*, 1998, Vol.16, p.85-88, 16 refs.

Ice physics, Hydrogen bonds, Molecular structure, Surface structure, Adsorption, Ice solid interface, Porosity, Aggregates, Ice spectroscopy, Infrared spectroscopy, Spectra, Radiation absorption

53-6

Observations of fish mortality associated with ice blasting on the Lower Rideau River, Ottawa, Ontario.

Schaap, P.R.H., Thomas, C.J., Reid, B.A., *Canadian field-naturalist*, 1998, 112(2), p.241-244, 6 refs.

River ice, Flood control, Ice control, Ice blasting, Biomass, Classifications, Survival, Statistical analysis, Environmental impact, Explosion effects, Sampling, Canada—Ontario—Lower Rideau River, Canada—Ontario—Ottawa

53-7

Free-OH stretching frequencies of 3-coordinated H<sub>2</sub>O in water clusters and on ice surfaces.

Jiang, J.C., Chang, J.C., Wang, B.C., Lin, S.H., Lee, Y.T., Chang, H.C., *Chemical physics letters*, June 12, 1998, Vol.289, p.373-382, 26 refs.

Ice physics, Water structure, Ice water interface, Molecular structure, Surface structure, Hydrogen bonds, Classifications, Resonance, Infrared spectroscopy, Radiation absorption, Molecular energy levels

53-8

Smart ice detection systems based on resonant piezoelectric transducers.

Roy, S., Izad, A., DeAnna, R.G., Mehregany, M., *Sensors and actuators*, Sep. 15, 1998, A69(3), p.243-250, 9 refs.

Aircraft icing, Safety, Ice detection, Electronic equipment, Sensors, Ice accretion, Vibration, Resonance, Computer applications, Design, Performance, Semiconductors (materials)

53-9

Documentation of glacier tongue variations and lake development in the Cordillera Blanca, Peru.

Ames, A., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.1-36, With German summary. 50 refs.

Mountain glaciers, Glacier oscillation, Glacier melting, Glacier tongues, Glacial lakes, Glacier surveys, Aerial surveys, Periodic variations, Peru—Cordillera Blanca

53-10

Regime of Muraviev Glacier in the Djungarskiy Alatau Range of Kazakhstan, central Asia.

Akhmetova, G.D., Cherkasov, P.A., Hastenrath, S., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.37-46, With German summary. 19 refs.

Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation, Glacier flow, Radio echo soundings, Topographic features, Periodic variations, Kazakhstan—Dzhungarskiy Alatau

53-11

Existence of glaciers in Bavaria, demonstrating climatic limitations of mountain glaciation.

Glazirin, G., Escher-Vetter, H., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.47-56, With German summary. 14 refs.

Mountain glaciers, Alpine glaciation, Glacier oscillation, Ice volume, Altitude, Snow cover distribution, Climatic changes, Climatic factors, Forecasting, Statistical analysis, Germany—Bavaria

53-12

Age of the Köfels event. Relative, <sup>14</sup>C and cosmogenic isotope dating of an early Holocene landslide in the Central Alps (Tyrol, Austria).

Ivy-Ochs, S., et al, *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.57-68, With German summary. 35 refs.

Geomorphology, Alpine landscapes, Landslides, Wood, Rock streams, Quaternary deposits, Gamma irradiation, Isotope analysis, Radioactive age determination, Correlation, Geochronology, Austria—Alps

53-13

Aerophotogrammetric study of ice movement in surging glaciers.

Knizhnikov, I.U.F., Gelman, R.N., Osipova, G.B., Tsvetkov, D.G., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.69-84, With German summary. 2 refs.

Glacier oscillation, Glacier surges, Glacier surveys, Velocity measurement, Glacier tongues, Icefalls, Photogrammetric surveys, Stereomapping, Stereoscopy, Diurnal variations, Russia—Pamir-Alai

53-14

1995 glacier measurement in the vicinity of the Pasterze (Glockner Group). [Gletschermessungen 1995 an und in der Umgebung der Pasterze (Glocknergruppe)]

Lieb, G.K., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1998, 34(1), p.85-88, In German.

Glacier surveys, Glacier flow, Mountain glaciers, Profiles, Glacier oscillation, Seasonal variations, Austria—Pasterze

53-15

1996 and 1997 glacier measurements of the Pasterze (Glockner Group). [Gletschermessungen 1996 und 1997 an der Pasterze (Glocknergruppe)]

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53-16

Modification of braided outwash surfaces by aufeis: an example from Pedersenbreen, Svalbard.

Bennett, M.R., Huddart, D., Hambrey, M.J., Ghienne, J.F., *Zeitschrift für Geomorphologie*, Mar. 1998, 42(1), p.1-20, With German and French summaries. 21 refs.

Geomorphology, Glacial hydrology, Glacial geology, Subpolar regions, Naleds, Landforms, Classifications, Sedimentation, Outwash, Moraines, Correlation, Norway—Svalbard

53-17

Problems of stability and drainage of ice masses, as surficial sediments, and applications to the late Weichselian glacial event in the north of Ireland.

Knight, J., *Zeitschrift für Geomorphologie*, Mar. 1998, 42(1), p.57-73, With German and French summaries. 27 refs.

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53-18

Relative contributions of summer and cool-season precipitation to groundwater recharge, Spring Mountains, Nevada, USA.

Winograd, I.J., Riggs, A.C., Coplen, T.B., *Hydrogeology journal*, June 1998, 6(1), p.77-93, With French and Spanish summaries. 40 refs.

Watersheds, Hydrogeochemistry, Springs (water), Ground water, Water flow, Precipitation (meteorology), Snow composition, Snowfall, Snowmelt, Seasonal variations, Sampling, Isotope analysis, United States—Nevada—Spring Mountains

53-19

Lidar observation of the cirrus cloud in the tropopause at Chung-Li (25°N, 121°E).

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Clouds (meteorology), Cloud cover, Cloud physics, Optical properties, Ice crystals, Ice detection, Lidar, Classifications, Taiwan—Chung-Li

53-20

Quaternary history of the antarctic circumpolar current: evidence from the Scotia Sea.

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Marine geology, Oceanography, Bottom sediment, Quaternary deposits, Sedimentation, Ocean currents, Ice rafting, Radio echo soundings, Drill core analysis, Lithology, Geochronology, —Scotia Sea

- 53-21**  
Effects of sublimation-condensation region on heat and mass transfer during microwave freeze drying.  
Wang, Z.H., Shi, M.H., *Journal of heat transfer*, Aug. 1998, 120(3), p.654-660, 16 refs.  
Ice physics, Freeze drying, Porous materials, Ice sublimation, Saturation, Heat transfer, Mass transfer, Vapor transfer, Microwaves, Mathematical models, Simulation
- 53-22**  
Heat and moisture transfer in energy wheels during sorption, condensation, and frosting conditions.  
Simonson, C.J., Besant, R.W., *Journal of heat transfer*, Aug. 1998, 120(3), p.699-708, 26 refs.  
Heat pumps, Coatings, Humidity, Moisture transfer, Heat transfer, Ice formation, Frost, Condensation, Absorption, Cold weather operation, Mathematical models
- 53-23**  
Summer biomass of a population of *Phyllophora antarctica* (Phylloporaceae, Rhodophyta) from Antarctica.  
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Marine biology, Biomass, Algae, Growth, Sampling, Statistical analysis, Antarctica—Terra Nova Bay
- 53-24**  
Distribution of methane in waters of the Okhotsk and western Bering Seas, and the area of the Kuril Islands.  
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Oceanography, Marine biology, Ecosystems, Biomass, Subpolar regions, Water chemistry, Geochemistry, Natural gas, Saturation, Distribution, Sampling, Bering Sea, Russia—Kuril Islands, Okhotsk Sea
- 53-25**  
Formation and growth of ice particles in stationary ultrasonic fields.  
Bauerecker, S., Niedhart, B., *Journal of chemical physics*, Sep. 8, 1998, 109(10), p.3709-3712, 27 refs.  
Ice physics, Cloud physics, Aerosols, Ice fog, Ice formation, Particles, Aggregates, Snowflakes, Sound waves, Infrared spectroscopy, Ultrasonic tests
- 53-26**  
Comparison of the structural and orientational glass-transition dynamic in ethanol.  
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Hydrocarbons, Liquid cooling, Supercooling, Phase transformations, Dielectric properties, Temperature effects, Spectroscopy, Spectra, Low temperature tests
- 53-27**  
Stratified classification of digitized aerial photography to avoid misclassification of subarctic vegetation types in northern Finland.  
Pellikka, P., *Photogrammetric journal of Finland*, 1997, 15(2), p.21-30, 15 refs.  
Aerial surveys, Photography, Subarctic landscapes, Forest ecosystems, Vegetation patterns, Sensor mapping, Classifications, Photointerpretation, Accuracy, Image processing, Computer programs, Finland
- 53-28**  
Metastable *T-P* phase diagram and anomalous thermodynamic properties of supercooled water.  
Poniatovskii, E.G., Sinitsyn, V.V., Pozdniakova, T.A., *Journal of chemical physics*, Aug. 8, 1998, 109(6), p.2413-2422, 48 refs.  
Ice physics, Amorphous ice, Water structure, Water temperature, Supercooling, Temperature variations, Thermodynamic properties, Atmospheric pressure, Phase transformations, Thermal expansion, Mathematical models, Molecular energy levels
- 53-29**  
Glacial geology: ice sheets and landforms.  
Bennett, M.R., Glasser, N.F., Chichester, England, John Wiley & Sons, 1996, 364p., Numerous refs. passim.  
DLC GB581.B45 1996  
Glacial geology, Glaciation, Ice sheets, Glacial erosion, Glacial deposits, Glacier mass balance, Glacier flow, Subglacial drainage, Glacial till, Moraines, Sediment transport, Landforms, Geomorphology
- 53-30**  
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Building codes, Snow loads, Wind pressure, Ice storms, Ice loads, Temperature effects, Cold weather construction, Design criteria, Design, Russia
- 53-31**  
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DLC QE690.L56 1992  
Tectonics, Glacial geology, Marine geology, Paleoclimatology, Climatic changes, Ice sheets, Antarctica—Ross Sea
- 53-32**  
Discussion of workshop results.  
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DLC QE690.L56 1992  
Tectonics, Glacial geology, Glaciation, Marine geology, Ice sheets, Antarctica—Transantarctic Mountains
- 53-33**  
Role of the cratonic interior, intracratonic basins and Transantarctic Mountains regions of East Antarctica in deciphering Late Mesozoic-Cenozoic tectonic and palaeoclimate history.  
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DLC QE690.L56 1992  
Tectonics, Glacial geology, Paleoclimatology, Ice sheets, Subglacial observations, Antarctica—East Antarctica
- 53-34**  
Episodic Cenozoic uplift and tectonism along the shoulder escarpment of the West Antarctic rift system.  
Behrendt, J.C., LIRA Workshop on Landscape Evolution, Haarlem, Netherlands, Sep. 28-Oct. 2, 1992: a multidisciplinary approach to the relationship between Cenozoic climate change and tectonics in the Ross Sea area, Antarctica. Proceedings. Edited by F.M. van der Wateren, A.L.L.M. Verbers, and F. Tessensohn, Haarlem, Netherlands, Rijks Geologische Dienst, 1994, p.37-39, 18 refs.  
DLC QE690.L56 1992  
Tectonics, Glacial geology, Volcanoes, Ice sheets, Antarctica—West Antarctica
- 53-35**  
Uplift of the Transantarctic Mountains: constraints from fission track thermochronology.  
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Tectonics, Glacial geology, Geochronology, Paleoclimatology, Antarctica—Transantarctic Mountains
- 53-36**  
Geology and tectonics of the Mt. Gerlache area, Prince Albert Mountains, Antarctica.  
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DLC QE690.L56 1992  
Tectonics, Glacial geology, Glacial deposits, Antarctica—Gerlache, Mount
- 53-37**  
Marine geological record of Ross Sea glacial history.  
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DLC QE690.L56 1992  
Marine geology, Glaciation, Glacial geology, Seismic surveys, Ice sheets, Antarctica—Ross Sea
- 53-38**  
Structural evolution across a section south of the Drygalski Ice Tongue (Victoria Land Basin).  
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DLC QE690.L56 1992  
Structural analysis, Marine geology, Glacial geology, Geochronology, Seismic surveys, Glacier tongues, Antarctica—Drygalski Ice Tongue
- 53-39**  
Evidence of Cenozoic tectonics in the sedimentary record of the Ross Sea continental margin.  
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DLC QE690.L56 1992  
Tectonics, Glacial geology, Marine geology, Seismic surveys, Antarctica—Ross Sea

53-40

**Cenozoic glacial record from drill-holes in the Ross Sea region.**

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DLC QE690.L56 1992

Marine geology, Glacial geology, Paleoclimatology, Ice cover thickness, Climatic changes, Glaciation, Antarctica—Ross Sea

53-41

**Main stages of development of the Eastern Basin, Ross Sea, imprinted in its structure.**

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DLC QE690.L56 1992

Tectonics, Glacial geology, Marine geology, Structural analysis, Antarctica—Ross Sea

53-42

**Correlating antarctic marine and terrestrial sediments by marine diatoms.**

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DLC QE690.L56 1992

Glacial geology, Sediments, Algae, Biomass, Paleoclimatology, Ice volume

53-43

**Continuing debate on Pliocene antarctic deglaciation.**

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DLC QE690.L56 1992

Marine geology, Fossils, Glacial geology, Paleoclimatology, Glaciation, Ice volume

53-44

**Glaciological and climatological probabilities and improbabilities of alternative glaciation models of Antarctica.**

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DLC QE690.L56 1992

Tectonics, Glacial geology, Ice volume, Glaciation, Paleoclimatology, Ice models, Antarctica—Transantarctic Mountains

53-45

**Pagodroma Tillite and the Sirius Group—a comparison.**

McKelvey, B., LIRA Workshop on Landscape Evolution, Haarlem, Netherlands, Sep. 28-Oct. 2, 1992: a multidisciplinary approach to the relationship between Cenozoic climate change and tectonics in the Ross Sea area, Antarctica. Proceedings. Edited by F.M. van der Wateren, A.L.L.M. Verbers, and F. Tessensohn, Haarlem, Netherlands, Rijks Geologische Dienst, 1994, p.113-116, 18 refs.

DLC QE690.L56 1992

Tectonics, Glacial geology, Fossils, Geochronology, Glacial deposits, Paleoclimatology, Antarctica—East Antarctica

53-46

**Upper Fleming Sirius till: evidence for local glaciation and warmer climates during the Neogene.**

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DLC QE690.L56 1992

Tectonics, Glacial geology, Glacial deposits, Glaciation, Paleoclimatology, Antarctica—McMurdo Dry Valleys

53-47

**Differential tectonic uplift of fault blocks in the West Antarctic rift system and their landscape evolution histories.**

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53-169

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53-175

**Marine ice beneath Filchner Ice Shelf: evidence from a multi-disciplinary approach.**

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Ice shelves, Ice cover thickness, Ice bottom surface, Ice heat flux, Ice water interface, Ice melting, Sea water freezing, Ice formation, Ice growth, Subglacial observations, Radio echo soundings, Antarctica—Filchner Ice Shelf

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**Tides in the Weddell Sea.**

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Oceanographic surveys, Tides, Tidal currents, Ice shelves, Ice water interface, Ice cover effect, Subglacial observations, Computerized simulation, Antarctica—Weddell Sea

53-177

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Oceanographic surveys, Ocean bottom, Bottom topography, Sounding, Subglacial observations, Topographic maps, Data processing, Antarctica—Weddell Sea

53-178

**Geotechnical study of the runway at the Eduardo Frei Station. [Análisis geotécnico preliminar del umbral sur del aeródromo de Base Presidente Frei, isla Rey Jorge, Antártica]**

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Runways, Aircraft landing areas, Climatic changes, Soil air interface, Surface drainage, Soil trafficability, Soil erosion, Thaw weakening, Antarctica—Eduardo Frei Station

53-179

**Dealing with marine plastic wastes in areas not covered by the Antarctic Treaty. [Sugerencias para minimizar la contaminación marítima con desechos plásticos de fuera del Área del Tratado Antártico]**

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Marine biology, Sea ice, Bacteria, Brines, Microbiology, Antarctica

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**Interaction of microwaves with sea ice.**

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Sea ice, Pack ice, Ice surveys, Remote sensing, Microwaves, Backscattering, Ice optics, Ice microstructure, Porosity, Dielectric properties, Mathematical models

53-183

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Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Heterogeneous nucleation, Ozone, Aerosols, Volcanic ash, Photochemical reactions, Degradation, Models, Simulation, Environmental impact, Antarctica

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**Evaporation of intercepted snow: measurement and modelling.**

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53-186

**Organic matter sources and early diagenetic alterations in arctic surface sediments (Lena River delta and Laptev Sea, eastern Siberia). II. Molecular and isotopic studies of hydrocarbons.**

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## 53-190

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## 53-192

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## 53-193

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Pleistocene, Glacial geology, Glacial deposits, Glacier oscillation, Volcanic ash, Quaternary deposits, Stratigraphy, Geochronology, Radioactive age determination, Argentina

## 53-195

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Solutions, Frozen liquids, Hydrates, Ion exchange, Melting points, Electrical resistivity, Stability, Electrical measurement, Temperature effects

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Mass transfer, Porous materials, Freeze drying, Ice vapor interface, Ice sublimation, Vapor pressure, Humidity, Moisture transfer, Heat transfer coefficient, Analysis (mathematics), Temperature effects

## 53-202

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## 53-203

**Snow cover investigations—data about air quality.**

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Air pollution, Snow cover, Snow air interface, Snow composition, Snow impurities, Aerosols, Sampling, Environmental tests, Statistical analysis, Lithuania

## 53-204

**Investigation of ice-solid interfaces by force microscopy: plastic flow and adhesive forces.**

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Ice physics, Ice strength, Ice solid interface, Ice adhesion, Mechanical properties, Plastic deformation, Plastic flow, Vacuum freezing, Electrical measurement

## 53-205

**Modeling the cyclic loading response of sea ice.**

Cole, D.M., MP 5219, *International journal of solids and structures*, Nov. 1998, 35(31-32), p.4067-4075, 22 refs.

Sea ice, Ice models, Ice mechanics, Ice solid interface, Strain tests, Dynamic loads, Ice relaxation, Porosity, Brines, Elastic properties, Mathematical models

This paper describes a physically based model of the elastic and anelastic behavior of sea ice subjected to zero-mean-stress cyclic loading. It incorporates the influence of porosity and fabric. The work demonstrates that despite the complexity of the sea ice microstructure, it is possible to develop links between its physical and mechanical properties through careful experimentation and detailed physical properties measurements. The model accounts directly for the influence of temperature on the effective elastic properties (both through the lattice constants and through the total porosity), and on the dominant dislocations and grain boundary relaxation processes. It is shown via compliance measurements that the strength of the dislocation relaxation (and by inference the grown-in dislocation density) increases dramatically with the brine porosity. Discussion centers on the physical basis of the model and it is shown that the model predictions compare favorably with the available experimental data.

## 53-206

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Geomorphology, Glacial geology, Glacial lakes, Flooding, Surface drainage, Water erosion, Quaternary deposits, Lacustrine deposits, Isostasy, Drill core analysis, Stratigraphy, Geochronology, Canada—Saskatchewan

## 53-207

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Microbiology, Bacteria, Porous materials, Colloids, Ice nuclei, Heterogeneous nucleation, Freezing rate, Freezing points, Temperature measurement, Temperature control

## 53-208

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Pleistocene, Permafrost, Sediments, Soil analysis, Tundra soils, Soil microbiology, Biomass, Bacteria, Viability, Sampling, Geochemistry, Russia—Siberia

## 53-209

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## 53-210

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## 53-211

**Where ice isn't nice.**

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Marine biology, Cryobiology, Biomass, Cold weather survival, Antifreezes, Chemical composition, Chemical analysis, Origin, Antarctica

## 53-212

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Pleistocene, Paleoclimatology, Oceanography, Marine geology, Ice sheets, Climatic changes, Glacier oscillation, Ocean currents, Ice rafting, Sedimentation, Quaternary deposits, Research projects, Greenland, Norway—Svalbard, North Atlantic Ocean

## 53-213

**Fluctuations of the Svalbard-Barents Sea ice sheet during the last 150,000 years.**

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## 53-214

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## 53-215

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## 53-216

**Paleoceanography of the last interglacial/glacial cycle in the polar North Atlantic.**

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Pleistocene, Oceanography, Ocean currents, Mass transfer, Marine geology, Marine deposits, Sedimentation, Glacier melting, Ice rafting, Stratigraphy, Drill core analysis, North Atlantic Ocean

## 53-217

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Pleistocene, Marine geology, Glacial geology, Glacial deposits, Glacier oscillation, Sedimentation, Stratigraphy, Seismic reflection, Geochronology, Greenland, Barents Sea, Norway—Svalbard

## 53-218

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Pleistocene, Marine geology, Glacial geology, Glacier oscillation, Sedimentation, Ice rafting, Marine deposits, Quaternary deposits, Stratigraphy, Drill core analysis, Geochronology, Insolation, North Atlantic Ocean

## 53-219

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Pleistocene, Glacial geology, Marine geology, Glacial erosion, Water erosion, River basins, Glacial deposits, Bedrock, Sediment transport, Seismic velocity, Drill core analysis, Correlation, Norway—Svalbard, Barents Sea

## 53-220

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## 53-221

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Climatic changes, Ice cores, Geochemistry, Sediments, Global change, Paleoclimatology, Greenland, Antarctica—Taylor Dome, Antarctica—Ross Sea

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Ice cores, Ice temperature, Research projects, History, Greenland

## 53-225

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## 53-226

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## 53-227

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Mineralogy, Geologic structures, Tectonics, Thermal regime, Antarctica—East Antarctica, Antarctica—Rauer Islands

## 53-228

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Bacteria, Algae, Photosynthesis, Microbiology, Sediments, Ice cover, Frozen lakes, Lake ice, Ice cover effect, Antarctica—McMurdo Dry Valleys

## 53-229

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Algae, Plant physiology, Plant ecology, Cryobiology, Cold tolerance, Acclimatization, Microbiology, Molecular structure

## 53-230

**Proceedings.**

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DLC QB330.G69 1997

Geodetic surveys, Geophysical surveys, Earth crust, Continental drift, Tectonics, Subglacial observations, Sea level, Polar regions

## 53-231

**Arctic airborne gravity measurement program.**

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Research projects, Geodetic surveys, Gravity, Geomagnetism, Mapping, Subglacial observations, Ice cover effect, Polar regions

## 53-232

**Airborne geoid measurements in the Arctic Ocean.**

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Geodetic surveys, Oceanographic surveys, Gravity anomalies, Height finding, Models, Polar regions

## 53-233

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Geodetic surveys, Tectonics, Gravity anomalies, Glacier melting, Models, Global warming, Ice deformation, Iceland

## 53-234

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Geodetic surveys, Isostasy, Gravity anomalies, Geophysical surveys, Mapping, Models, Ocean bottom, Antarctica—Ross Sea

## 53-235

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DLC QB330.G69 1997

Tectonics, Height finding, Mapping, Data processing, Geodetic surveys, Ocean bottom, Oceanographic surveys, Gravity anomalies, Earth crust

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DLC QB330.G69 1997

Geodetic surveys, Height finding, Oceanographic surveys, Data processing, Gravity anomalies, Mapping, Imaging, Antarctica—Weddell Sea

## 53-237

**Mean sea-level and its seasonal change observed at Syowa Station, East Antarctica.**

Odamaki, M., Michida, Y., Oka, K., Oikawa, K., *International Association of Geodesy Symposia*, 1997, Vol. 117, International Symposium on Gravity, Geoid and Marine Geodesy, Tokyo, Japan, Sep. 30-Oct. 5, 1996. Proceedings. Edited by J. Segawa, H. Fujimoto and S. Okubo, p.659-665, 9 refs.

DLC QB330.G69 1997

Oceanographic surveys, Sea level, Seasonal variations, Ocean currents, Instruments, Antarctica—Showa Station

## 53-238

**Measurement of the field of the Pasterze (Glockner Group) in 1991. [Nachmessungen im Bereich der Pasterze (Glocknergruppe) im Jahr 1991]**

Lieb, G.K., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1997, 33(2), p.197-201, In German.

Mountain glaciers, Glacier surveys, Glacier flow, Glacial geology, Moraines, Seasonal variations, Austria—Pasterze

## 53-239

**Glacial survey of the Pasterze and its vicinity (Glockner Group) in 1992. [Gletschermessungen an der Pasterze und deren Umgebung (Glocknergruppe) im Jahr 1992]**

Lieb, G.K., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1997, 33(2), p.203-207, In German.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacial geology, Moraines, Profiles, Seasonal variations, Austria—Pasterze

## 53-240

**Glacier survey of the Pasterze (Glockner Group) and vicinity in 1993. [Gletschermessungen 1993 an und in der Umgebung der Pasterze (Glocknergruppe)]**

Lieb, G.K., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1997, 33(2), p.209-212, In German.

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacial geology, Moraines, Profiles, Seasonal variations, Austria—Pasterze

## 53-241

**Glacier survey of the Pasterze (Glockner Group) and vicinity in 1994. [Gletschermessungen 1994 an und in der Umgebung der Pasterze (Glocknergruppe)]**

Lieb, G.K., *Zeitschrift für Gletscherkunde und Glazialgeologie*, 1997, 33(2), p.213-216, In German.

Glacier surveys, Mountain glaciers, Glacier oscillation, Glacial geology, Profiles, Seasonal variations, Austria—Pasterze

## 53-242

**Cold-weather clean.**

Martel, C.J., MP 5220, *Water environment & technology*, Aug. 1998, 10(8), p.50-53.

Water treatment, Waste treatment, Cold weather operation, Sludges, Freeze thaw cycles, Sublimation, Snow manufacturing, Artificial snow, Storage, Hydraulic structures, Air temperature

After several years of research, the U.S. Army Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, NH, developed the freezing bed as a low-cost method of sludge dewatering at U.S. Army and U.S. Air Force bases in cold regions. The bed consists of an in-ground concrete structure deep enough to freeze several layers of sludge. The ramp on one end evenly distributes incoming sludge within the bed and allows vehicle access. The opposite end of the bed is equipped with an overflow gate or drain valves to draw off excess sludge or supernatant produced during thaw. The bottom of the bed is covered with 60 to 100 mm of sand, which allows the meltwater to drain. The meltwater is then collected in the sump and pumped back to the head of the plant. The bed is covered with a roof to keep out rain and snow, preventing snow from insulating the bed and slowing the freezing rate. It also stops rain from rewetting the sludge after it has thawed and the water has drained. The freezing bed is used to dewater sludge, and snowmaking is used to treat and store wastewater in the form of ice.

## 53-243

**Precious pipe.**

Coutermarsh, B.A., MP 5221, *Water environment & technology*, Aug. 1998, 10(8), p.55-57.

Water pipelines, Underground pipelines, Frost resistance, Frost protection, Excavation, Pipeline insulation, Polymers, Shells, Computer programs, Performance

In general, engineers are uncomfortable with insulating pipe and burying it at a shallow depth. Instead of empirical case studies, they want hard data. The U.S. Army Corps of Engineers' Cold Regions Research and Engineering Laboratory in Hanover, NH, has provided such data. Researchers at the Cold Regions Lab believe shallow burial technology has merit for the U.S. construction industry and the municipal governments it serves. If a sound procedure can be developed to keep pipelines from freezing, utility installations can be sped up, saving in labor costs, especially where pipe must be buried in ledge. Because ledge has a generally higher thermal conductivity than soil, pipes in ledge must be buried deep to be protected from freezing. A shallow burial option would avoid the extra time and considerable expense associated with blasting and excavating ledge.

## 53-244

**Historical perspectives on the Arctic Program at the Office of Naval Research.**

Curtin, T.B., *Naval research reviews*, 1998, No.1, p.6-8, 1 ref.

Research projects, Oceanography, Climatology, History, Exploration, Arctic Ocean

## 53-245

**Arctic climate variability: observations and model simulations.**

Walsh, J.E., *Naval research reviews*, 1998, No.1, p.9-11, 7 refs.

Climatology, Polar atmospheres, Climatic changes, Sea ice distribution, Surface temperature, Seasonal variations, Simulation, Statistical analysis

## 53-246

**Bottom water formation and distribution in the Weddell Sea.**

Gordon, A.L., *Naval research reviews*, 1998, No.1, p.13-16, 4 refs.

Oceanography, Ice shelves, Ocean currents, Ocean bottom, Hydrography, Salinity, Antarctica—Weddell Sea

## 53-247

**Sea ice growth in antarctic leads: top freezing vs. bottom melting.**

Ackley, S.F., MP 5222, *Naval research reviews*, 1998, No.1, p.17-18, 4 refs.

Oceanography, Ice openings, Sea ice, Heat flux, Ice growth, Ice melting, Ice water interface, Ice cover effect, Models, Antarctica

Ice growth in leads (covered with thin ice) is typically treated as a one-dimensional heat transfer problem, with the energy balance at the bottom ice surface balanced between three terms: conduction of heat upward through the overlying ice, upward ocean heat flux and the latent heat of the phase change from water to ice at the ice bottom. Observations, however, show a radically different behavior for ice growth in antarctic sea ice leads than is currently used in models. During the winter Antarctic Zone Flux Experiment, the authors installed thermistor strings and ice thickness gauges into leads and sea ice at the beginning of two drift experiments. The sites were measured at 15 minute intervals for temperature, twice daily for ice thickness changes and periodically for ice structure during the experiment. Two dilemmas summarize the conflict of the observations with some models: the direct melting of sea ice by the ocean heat flux is observed rather than ventilation through leads, and ice of observed mean thickness or thinner is predicted to melt prematurely when typical heat flux models are used.

## 53-248

**Modeling sea ice behavior.**

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Oceanography, Sea ice distribution, Ice openings, Ice models, Ice cover strength, Ice mechanics, Anisotropy, Ice plasticity, Mathematical models

## 53-249

**Sea ice thickness distribution as a state variable.**

Thorndike, A., *Naval research reviews*, 1998, No.1, p.23-24.

Oceanography, Sea ice distribution, Ice cover thickness, Pack ice, Statistical analysis, Simulation, Theories

## 53-250

**Project SPINNAKER; ICESHELF 1988-1996 and beyond.**

Newton, J.L., *Naval research reviews*, 1998, No.1, p.25-28.

Oceanography, Ice shelves, Oceanographic surveys, Research projects, Subglacial observations, Underwater acoustics, Sensors, Ocean currents, Hydrography, Lincoln Sea

## 53-251

**Interdisciplinary interaction in arctic research.**

Niebauer, H.J., *Naval research reviews*, 1998, No.1, p.29-31.

Research projects, Oceanography, Marine meteorology, Sea ice, Ice edge, Air ice water interaction, Advection, Research projects, Arctic Ocean

## 53-252

**Electrophysiological investigation of frost resistance in plants. 2. Bioelectrical responses to light of three contrasting cultivars of *Triticum aestivum* at various temperatures.**

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Plant physiology, Grasses, Photosynthesis, Cold tolerance, Frost resistance, Low temperature tests, Temperature effects, Light effects, Electrical measurement, Statistical analysis

53-253

**Freeze-thaw stability of three waxy maize starch pastes measured by centrifugation and calorimetry.**

Yuan, R.C., Thompson, D.B., *Cereal chemistry*, July-Aug. 1998, 75(4), p.571-573, 12 refs.

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53-254

**Mr. Freeze.**

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Weather observations, Snowstorms, Lake effects, Lake ice, Ice formation, Air ice water interaction, Water temperature, Density (mass/volume), Temperature effects, United States—Erie, Lake

53-255

**Effects of Quaternary sea level cycles on strontium in seawater.**

Stoll, H.M., Schrag, D.P., *Geochimica et cosmochimica acta*, Apr. 1998, 62(7), p.1107-1118, 46 refs.

Pleistocene, Marine geology, Sea level, Water chemistry, Weathering, Geochemical cycles, Quaternary deposits, Chemical analysis, Isotope analysis, Models, Accuracy, Indexes (ratios)

53-256

**Effect of thawing conditions on the recovery of reactive silicic acid from frozen natural water samples.**

Zhang, J.Z., Ortner, P.B., *Water research*, Aug. 1998, 32(8), p.2553-2555, 18 refs.

Water chemistry, Water treatment, Sampling, Preserving, Cold storage, Frozen liquids, Thawing rate, Laboratory techniques

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Blewett, W.L., *Great Lakes geography*, 1995, 2(1), p.1-15, 15 refs.

Pleistocene, Glacial geology, Landforms, Glacier oscillation, Ice edge, Moraines, Outwash, Glacial erosion, Geochronology, United States—Michigan

53-258

**Environmental magnetic record of antarctic palaeoclimate from Eocene/Oligocene glaciomarine sediments, Victoria Land Basin.**

Sagnotti, L., Florindo, F., Verosub, K.L., Wilson, G.S., Roberts, A.P., *Geophysical journal international*, Sep. 1998, 134(3), p.653-662, 35 refs.

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53-259

**Inconsistent palaeomagnetic recording of the Blake event in Chinese loess related to sedimentary environment.**

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Pleistocene, Geomagnetism, Sedimentation, Loess, Soil formation, Remanent magnetism, Stratigraphy, Mineralogy, Correlation, China—Loess Plateau

53-260

**New seismic data support Cenozoic rifting in George VI Sound, Antarctic Peninsula.**

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Tectonics, Geological surveys, Earth crust, Sedimentation, Geologic structures, Thermal stresses, Glacial geology, Ice solid interface, Seismic reflection, Synthetic aperture radar, Antarctica—George VI Sound

53-261

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Polar atmospheres, Meteorological data, Weather observations, Weather stations, Synoptic meteorology, Solar radiation, Ultraviolet radiation, Radiation measurement, Ozone, Turbidity, Antarctica—Showa Station, Antarctica—Dome Fuji Station

53-262

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DLC GB2403.2.H84 1997

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53-264

**Air void system and frost resistance of concrete containing superplasticizers.**

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53-265

**Freeze-thaw resistance of superplasticized concretes.**

Okada, E., Hisaka, M., Kazama, Y., Hattori, K., International Conference on Developments in the Use of Superplasticizers in Concrete, Ottawa, June 1981. ACI publication SP-68. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1981, p.215-231, 17 refs.

Concrete strength, Concrete durability, Concrete admixtures, Air entrainment, Water cement ratio, Frost resistance, Frost protection, Freeze thaw tests

53-266

**High pressure penetration in standard concrete, water-reduced concrete and superplasticized concrete.**

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Reinforced concretes, Concrete durability, Concrete admixtures, Air entrainment, Water cement ratio, Frost resistance, Salting, Corrosion, Waterproofing, Freeze thaw tests

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**Frost resistance of superplasticized concrete.**

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Concrete durability, Concrete admixtures, Air entrainment, Water cement ratio, Frost resistance, Frost protection, Freeze thaw tests

53-268

**Mechanical properties and durability of superplasticized semi-lightweight concrete.**

Malhotra, V.M., International Conference on Developments in the Use of Superplasticizers in Concrete, Ottawa, June 1981. ACI publication SP-68. Edited by V.M. Malhotra, Detroit, American Concrete Institute, 1981, p.283-305, 9 refs.

Lightweight concretes, Concrete durability, Concrete strength, Concrete admixtures, Frost resistance, Frost protection, Freeze thaw tests

53-269

**Aspects of cement and energy economy in precast plants by the use of superplasticizers.**

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Precast concretes, Concrete admixtures, Cements, Concrete durability, Frost resistance, Freeze thaw tests, Romania

53-270

**Long-term fluctuation of hydroclimate elements in north-eastern Europe.**

Gutry-Korycka, M., Boryczka, J., *Institute of Geography and Spatial Organization. Polish Academy of Sciences. Conference papers*, 1990, No.6, Global Change Regional Research Centres: Scientific Problems and Concept Developments, Warsaw, Poland, Sep. 25-29, 1989. Seminar papers and IGBP WG2 report. Edited by A. Breyer, p.33-47, 12 refs.

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53-271

**Litter mass-loss rates in a climatic transect in north-western Europe - Effects of climate and substrate quality.**

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53-272

**Search for RRCs program in ecosystem ecology.**

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Research projects, Ecosystems, Ecology, Climatic changes, Litter, Climatic factors, Decomposition

53-273

**Ten years of climate observations at the Arc-towski and Bellingshausen stations (King George Is., South Shetlands, Antarctica).**

Martianov, V., Rakusa-Suszczewski, S., *Institute of Geography and Spatial Organization. Polish Academy of Sciences. Conference papers*, 1990, No.6, Global Change Regional Research Centres: Scientific Problems and Concept Developments, Warsaw, Poland, Sep. 25-29, 1989. Seminar papers and IGBP WG2 report. Edited by A. Breyer, p.80-87, 6 refs.

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Weather observations, Climatic changes, Weather stations, Ice air interface, Meteorological factors, Glacier melting, Antarctica—King George Island, Antarctica—Bellingshausen Sea



## 53-274

**Satellite radio-M1 (AMSAT OSCAR-21).**

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Spacecraft, Radio communication, Computers, Electronic equipment, Telemetering equipment, Telecommunication, Data processing

## 53-275

**Growth and hardening of four provenances of containerized white spruce (*Picea glauca* (Moench) Voss) seedlings in response to the duration of 16 h long-night treatments.**

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Plant physiology, Trees (plants), Forestry, Cold tolerance, Freezing, Damage, Frost resistance, Growth, Light effects, Low temperature tests, Statistical analysis

## 53-276

**Two-phase numerical model of powder avalanche theory and application.**

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Avalanche mechanics, Avalanche modeling, Avalanche tracks, Snow air interface, Aerosols, Fluid dynamics, Turbulent flow, Internal friction, Mathematical models, Mapping

## 53-277

**Phase diagram for the ice VI-VII-VIII transitions.**

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## 53-278

**Exponential neutral stability of a floating ice layer.**

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Ice mechanics, Floating ice, Ice water interface, Stability, Wave propagation, Ice breaking, Ice structure, Stratification, Mathematical models, Theories

## 53-279

**AMS and microprobe analysis of combusted particles in ice and snow.**

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Climatology, Air pollution, Hydrocarbons, Aerosols, Snow composition, Ice cores, Particles, Sublimation, Carbon isotopes, Ions, Spectroscopy, Environmental tests, Greenland

## 53-280

**Pursuit of isotopic and molecular fire tracers in the polar atmosphere and cryosphere.**

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Climatology, Polar atmospheres, Atmospheric composition, Forest fires, Biomass, Aerosols, Particles, Snow composition, Ice cores, Carbon isotopes, Isotope analysis, Correlation, Origin, Greenland

## 53-281

**Extension of the  $^{14}\text{C}$  calibration curve to ca. 40,000 cal BC by synchronizing Greenland  $^{18}\text{O}/^{16}\text{O}$  ice core records and North Atlantic foraminifera profiles: a comparison with U/Th coral data.**

Jörns, O., Weninger, B., *Radiocarbon*, 1998, 40(1), International Radiocarbon Conference, 16th, Groningen, Netherlands, June 16-20, 1997. Proceedings, Pt.I. Edited by W.G. Mook and J. van der Plicht, p.495-504, 44 refs.

Pleistocene, Geochronology, Paleocology, Radioactive age determination, Carbon isotopes, Marine deposits, Ice cores, Profiles, Stratigraphy, Statistical analysis, Correlation, Greenland, Atlantic Ocean

## 53-282

**Correlation of marine  $^{14}\text{C}$  ages from the Nordic seas with the GISP2 isotope record: implications for  $^{14}\text{C}$  calibration beyond 25 ka bp.**

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Pleistocene, Paleoclimatology, Geochronology, Paleocology, Sedimentation, Meltwater, Ice cores, Radioactive age determination, Carbon isotopes, Marine deposits, Correlation, Geomagnetism, Greenland, Iceland

## 53-283

**Flood basalts and magmatic Ni, Cu, and PGE sulphide mineralization: comparative geochemistry of the Noril'sk (Siberian Traps) and West Greenland sequences.**

Lightfoot, P.C., Hawkesworth, C.J., Large igneous provinces. Continental, oceanic, and planetary flood volcanism. Geophysical Monograph No.100. Edited by J.J. Mahoney and M.F. Coffin, Washington, D.C., American Geophysical Union, 1997, p.357-380, Refs. p.377-380.

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Geologic processes, Earth crust, Subpolar regions, Sedimentation, Magma, Degradation, Solubility, Geochemistry, Mineralogy, Stratigraphy, Russia—Siberia, Greenland

## 53-284

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Climatology, Climatic changes, Global change, Mountains, Air temperature, Temperature variations, Statistical analysis, Correlation, Altitude

## 53-286

**Variations of snow depth and duration in the Swiss Alps over the last 50 years: links to changes in large-scale climatic forcings.**

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Climatology, Climatic changes, Alpine landscapes, Snow cover distribution, Snow depth, Altitude, Seasonal variations, Atmospheric pressure, Atmospheric circulation, Statistical analysis, Correlation, Switzerland—Alps

## 53-287

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## 53-288

**Glacial varve thickness and 127 years of instrumental climate data: a comparison.**

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Climatology, Climatic changes, Alpine landscapes, Lacustrine deposits, Glacial deposits, Glacier oscillation, Snow accumulation, Glacier melting, Meltwater, Sedimentation, Seasonal variations, Statistical analysis, Switzerland—Alps

## 53-289

**Regional snowfall patterns in the high, arid Andes.**

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## 53-290

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Climatology, Climatic changes, Meteorological data, Glacier oscillation, Mountain glaciers, Paleocology, Age determination, Statistical analysis, Correlation, Canada—Rocky Mountains

## 53-291

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## 53-293

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Priscu, J.C., Neale, P.J., *Antarctic journal of the United States*, 1995, 30(5), p.301-303, 5 refs.

Lake water, Algae, Photosynthesis, Ice cover effect, Biomass, Antarctica—Bonney, Lake

## 53-294

Responses of bacterial growth to inorganic and organic nutrient enrichment in the lakes of the dry valleys, Antarctica.

Takacs, C.D., Priscu, J.C., *Antarctic journal of the United States*, 1995, 30(5), p.303-305, 8 refs.

Lake water, Water chemistry, Nutrient cycle, Bacteria, Limnology, Antarctica—McMurdo Dry Valleys

## 53-295

Some metamorphic processes in the lake ice of the McMurdo Dry Valleys.

Adams, E.E., Priscu, J.C., Sato, A., *Antarctic journal of the United States*, 1995, 30(5), p.307-309, 9 refs.

Lake ice, Air ice water interaction, Freezing, Ice mechanics, Bubbles, Frozen lakes, Ice temperature, Ice heat flux, Ice optics, Antarctica—Bonney, Lake

## 53-296

Soil chemistry along a glacial chronosequence on Andrews Ridge, Taylor Valley.

Ho, M.C., Virginia, R.A., Powers, L.E., Freckman, D.W., *Antarctic journal of the United States*, 1995, 30(5), p.310-311, 4 refs.

Soil chemistry, Desert soils, Glaciation, Soil dating, Paleoclimatology, Antarctica—Andrews Ridge

## 53-297

Ultraviolet-B radiation and vascular plant performance in Antarctica.

Day, T.A., McGraw, J.B., *Antarctic journal of the United States*, 1995, 30(5), p.313-314, 6 refs.

Ultraviolet radiation, Plant physiology, Ozone, Physiological effects, Plant ecology

## 53-298

Effects of random variability of cloud optical thickness on the derivation of total ozone abundance.

Zeng, J., Stamnes, K., *Antarctic journal of the United States*, 1995, 30(5), p.315-316, 6 refs.

Ozone, Clouds (meteorology), Ultraviolet radiation, Measurement

## 53-299

Volcanic aerosol and polar stratospheric clouds observed by lidar at McMurdo Station during 1994.

Adriani, A., Di Donfrancesco, G., *Antarctic journal of the United States*, 1995, 30(5), p.317-318, 3 refs.

Aerosols, Volcanoes, Polar stratospheric clouds, Measurement, Volcanic ash, Lidar, Antarctica—McMurdo Station

## 53-300

High-resolution ultraviolet spectral irradiance monitoring program. Contrasts in ultraviolet exposure in Antarctica and the Americas.

Booth, C.R., Lucas, T.B., Mestechkina, T., Schmidt, J., Tusson, J., IV, *Antarctic journal of the United States*, 1995, 30(5), p.318-320, 3 refs.

Ultraviolet radiation, Measurement, Research projects, Physiological effects, Antarctica

## 53-301

Long-term responses by antarctic phytoplankton to solar ultraviolet radiation.

Villafañe, V.E., Helbling, E.W., Holm-Hansen, O., Diaz, H., *Antarctic journal of the United States*, 1995, 30(5), p.320-323, 18 refs.

Ultraviolet radiation, Plant physiology, Physiological effects, Ozone, Marine biology, Biomass, Antarctica

## 53-302

Ultraviolet-absorbing compounds in natural assemblages of antarctic phytoplankton.

Dunlap, W.C., Rae, G.A., Helbling, E.W., Villafañe, V.E., Holm-Hansen, O., *Antarctic journal of the United States*, 1995, 30(5), p.323-326, 12 refs.

Ultraviolet radiation, Physiological effects, Plant physiology, Marine biology, Photochemical reactions, Ozone, Plankton, Antarctica

## 53-303

Physics of ice-covered seas. Lecture notes.

Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994, Leppäranta, M., ed, Helsinki, University, Department of Geophysics, 1998, 823p. (2 vols.), Refs. passim. For individual papers see 53-304 through 53-323. For papers from the same study institute-summer school previously published as selected papers see 51-263 through 51-273.

Sea ice, Air ice water interaction, Ice water interface, Ice heat flux, Ice cover effect, Drift, Ocean currents, Atmospheric circulation

## 53-304

On the history of research on sea ice.

Weeks, W.F., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.1-24, Refs. p.21-24.

Research projects, Expeditions, History, Sea ice, Ice surveys

## 53-305

Growth conditions and the structure and properties of sea ice.

Weeks, W.F., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.25-104, Refs. p.92-104.

Sea water freezing, Sea ice, Ice formation, Ice growth, Ice crystal structure, Ice structure, Ice composition, Ice salinity, Brines, Ice cover strength

## 53-306

Introduction to crystallization phenomena in natural and artificial sea ice.

Wettlaufer, J.S., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.105-194, Refs. p.187-194.

Sea ice, Ice crystal growth, Ice crystal structure, Water structure, Molecular structure, Hydrogen bonds, Sea water freezing, Ice heat flux, Ice heat loss, Ice formation, Ice structure, Phase transformations, Mathematical models

## 53-307

Optical properties of sea ice.

Perovich, D.K., MP 5223, Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.195-230, Refs. p.226-230.

Sea ice, Ice optics, Ice heat flux, Solar radiation, Light scattering, Light transmission, Optical absorption, Radiation balance, Albedo

## 53-308

Sea ice morphology.

Wadhams, P., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.231-287, Refs. p.281-287.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Air ice water interaction, Pressure ridges, Ice surface, Ice bottom surface, Global warming, Statistical analysis

## 53-309

Thermodynamics of sea ice.

Makshtas, A.P., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.289-304, 29 refs.

Sea ice, Ice thermal properties, Ice temperature, Ice heat flux, Snow ice interface, Air ice water interaction, Ice models, Mathematical models

## 53-310

Dynamics of sea ice.

Leppäranta, M., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.305-342, Refs. p.339-342.

Sea ice, Ice floes, Drift, Ice friction, Ice cover strength, Ice deformation, Ice cover thickness, Air ice water interaction, Wind factors, Ocean currents, Mathematical models

## 53-311

Ice dynamics models.

Timokhov, L.A., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.343-380, 21 refs.

Sea ice distribution, Ice conditions, Ice floes, Drift, Ice friction, Ice cover strength, Ice deformation, Air ice water interaction, Wind factors, Ocean currents, Ice models, Mathematical models

## 53-312

Marginal ice zone.

Squire, V.A., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.1. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.381-446, Refs. p.438-446.

Sea ice distribution, Ice edge, Ice floes, Ice conditions, Ice cover thickness, Ice cover effect, Ice water interface, Ocean waves, Wave propagation, Air ice water interaction, Ice friction, Ice deformation, Ice models, Mathematical models

## 53-313

Circulation in ice-covered waters.

Pavlov, V.K., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.447-481, 35 refs.

Sea ice distribution, Drift, Ice cover effect, Ice water interface, Ocean currents, Water transport

## 53-314

Freezing estuaries and semi-enclosed basins.

Omstedt, A., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.483-516, Refs. p.512-516.

Estuaries, River flow, Runoff, Sea water freezing, Ice formation, Ice heat flux, Ice water interface, Ice melting, Salinity, Mathematical models

## 53-315

Aspects of arctic oceanography.

Rudels, B., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.517-568, Refs. p.562-568.

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Air ice water interaction, Heat balance, Mathematical models



## 53-316

**Circulation and water masses in the Weddell Sea.**  
Fahrbach, E., Schröder, M., Klepikov, A., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.569-603, Refs. p.598-603.

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Ice shelves, Ice water interface, Meltwater, Antarctica—Weddell Sea

## 53-317

**Snow cover on sea ice.**

Granberg, H.B., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.605-649, Refs. p.643-649.

Sea ice, Snow ice interface, Metamorphism (snow), Snow stratigraphy, Snow heat flux, Snow air interface, Snowdrifts, Snow erosion, Wind erosion, Snow accumulation, Snowmelt, Regelation

## 53-318

**Arctic sea ice contamination: major characteristics and consequences.**

Lange, M.A., Pffirman, S.L., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.651-681, Refs. p.677-681.

Air pollution, Water pollution, Atmospheric circulation, Air ice water interaction, Ocean currents, River flow, Sea ice, Ice composition, Impurities, Drift, Ice rafting, Sediment transport, Nutrient cycle

## 53-319

**Atmosphere/sea ice interaction in global climate models: a review.**

Nagurny, A.P., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.683-714, Refs. p.710-714.

Air ice water interaction, Sea ice, Ice heat flux, Ice air interface, Ice cover thickness, Ice cover effect, Snow ice interface, Snow air interface, Atmospheric circulation, Global warming, Ice models, Mathematical models, Computerized simulation

## 53-320

**Atmospheric boundary layer over polar marine surfaces.**

Andreas, E.L., MP 5224, Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.715-773, Refs. p.767-773.

Polar atmospheres, Marine atmospheres, Atmospheric boundary layer, Wind pressure, Ice air interface, Ice heat flux, Ice cover effect, Turbulent exchange, Atmospheric circulation, Heat balance, Mathematical models

## 53-321

**Arctic meteorology and air/ice coupling.**

Overland, J.E., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.775-786, 17 refs.

Polar atmospheres, Marine meteorology, Air ice water interaction, Ice air interface, Sea ice, Ice heat flux, Heat balance, Atmospheric circulation, Atmospheric disturbances, Surface temperature

## 53-322

**Chemical oceanography in polar oceans.**

Anderson, L.G., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.787-809, 38 refs.

Oceanographic surveys, Sea ice, Ice salinity, Ice cover effect, Ice water interface, Meltwater, Sea water, Water temperature, Salinity, Water chemistry

## 53-323

**Summer school report.**

Leppäranta, M., Vihma, T., Haapala, J., Advanced Study Institute-Summer School on Physics of Ice-Covered Seas, Savonlinna, Finland, June 6-17, 1994. Lecture notes. Vol.2. Edited by M. Leppäranta, Helsinki, University, Department of Geophysics, 1998, p.811-823, 1 ref.

Education, Meetings, Research projects, Sea ice

## 53-324

**Repeat ground track analysis for the Geosciences Laser Altimeter System.**

Lim, S.S., Schutz, B.E., *Advances in the astronautical sciences*, 1996, 93(2), AAS/AIAA Spaceflight Mechanics Conference, 6th, Austin, TX, Feb. 12-15, 1996. Proceedings. Spaceflight mechanics 1996, edited by G.E. Powell, et al, p.1615-1622, 3 refs.

DLC TL787.A6A2 1996

Geodetic surveys, Geophysical surveys, Lasers, Height finding, Mapping, Radar tracking, Lidar, Antarctica—South Pole

## 53-325

**Estimation of ice sheet surface elevation change from the EOS laser altimeter satellite (Icesat) crossover simulation.**

Choe, C.J., Schutz, B.E., *Advances in the astronautical sciences*, 1996, 93(2), AAS/AIAA Spaceflight Mechanics Conference, 6th, Austin, TX, Feb. 12-15, 1996. Proceedings. Spaceflight mechanics 1996, edited by G.E. Powell, et al, p.1623-1638, 12 refs.

DLC TL787.A6A2 1996

Ice sheets, Sea ice, Land ice, Lasers, Spacecraft, Ice surface, Ice surveys, Height finding, Topographic surveys, Simulation, Periodic variations, Global change, Glacier surfaces, Glacier surveys, Lidar, Antarctica

## 53-326

**Antarctic automatic weather stations: 1994-1995.**

Holmes, R.E., Stearns, C.R., Weidner, G.A., *Antarctic journal of the United States*, 1995, 30(5), p.327-329, 3 refs.

Weather stations, Meteorological instruments, Maintenance, Weather observations, Site surveys, Antarctica

## 53-327

**Use of automatic weather station data for forecasting high wind speed events at Pegasus Runway.**

Holmes, R., Stearns, C., *Antarctic journal of the United States*, 1995, 30(5), p.329-331, 2 refs.

Weather stations, Weather forecasting, Wind velocity, Safety, Aircraft landing areas, Antarctica—Ross Island, Antarctica—Ross Ice Shelf

## 53-328

**Assessment of snow accumulation and transport dynamics using glass microspheres.**

Braaten, D.A., *Antarctic journal of the United States*, 1995, 30(5), p.331-333, 4 refs.

Snow accumulation, Blowing snow, Snow survey tools, Wind factors, Weather stations, Antarctica

## 53-329

**Case study of antarctic mesoscale using satellite-derived fields of atmospheric humidity and wind.**

McMurdie, L., Claud, C., Katsaros, K., *Antarctic journal of the United States*, 1995, 30(5), p.333-335, 6 refs.

Marine meteorology, Atmospheric pressure, Humidity, Wind factors, Antarctica

## 53-330

**Seasonal changes in surface pressure over Antarctica.**

Parish, T.R., Walsh, M.E., *Antarctic journal of the United States*, 1995, 30(5), p.335-337, 5 refs.

Atmospheric pressure, Seasonal variations, Air temperature, Wind factors, Antarctica

## 53-331

**Ice core record of CO variations during the last two millennia: atmospheric implications and chemical interactions within the Greenland ice.**

Haan, D., Raynaud, D., *Tellus*, July 1998, 50B(3), p.253-262, 36 refs.

Paleoclimatology, Atmospheric composition, Gases, Age determination, Ice sheets, Ice cores, Ice composition, Decomposition, Turbulent diffusion, Indexes (ratios), Statistical analysis, Greenland, Antarctica—Vostok Station

## 53-332

**Study of the 2.5-25μm spectrum of H<sub>2</sub>O ice.**

Maldoni, M.M., Smith, R.G., Robinson, G., Rookyard, V.L., *Royal Astronomical Society. Monthly notices*, July 21, 1998, 298(1), p.251-258, 27 refs.

Ice physics, Cosmic dust, Extraterrestrial ice, Ice optics, Radiation absorption, Amorphous ice, Ice spectroscopy, Infrared spectroscopy, Spectra, Phase transformations, Simulation

## 53-333

**Dry deposition and desorption of toxic gases to and from snow surfaces.**

Karlsson, E., Nyholm, S., *Journal of hazardous materials*, July 1998, 60(3), p.227-245, 36 refs.

Snow physics, Snow hydrology, Snow impurities, Air pollution, Gases, Adsorption, Snow air interface, Ice vapor interface, Snowmelt, Mathematical models, Simulation

## 53-334

**Distribution limits of *Pyrgo* species at the biogeographic boundaries of the arctic and the North-Atlantic boreal regions.**

Gudmundsson, G., *Journal of foraminiferal research*, July 1998, 28(3), p.240-256, 69 refs.

Marine biology, Biomass, Subpolar regions, Ocean bottom, Distribution, Ocean currents, Biogeography, Sampling, Statistical analysis, Classifications, North Atlantic Ocean, Arctic Ocean

## 53-335

**Infrared, surface-assisted laser desorption/ionization mass spectrometry on frozen aqueous solutions of proteins and peptides using suspensions of organic solids.**

Kraft, P., Alimpiev, S., Dratz, E., Sunner, J., *American Society for Mass Spectrometry. Journal*, Sep. 1998, 9(9), p.912-924, 47 refs.

Ice physics, Hydrocarbons, Solutions, Chemical composition, Ice spectroscopy, Infrared spectroscopy, Lasers, Ionization, Spectra

## 53-336

**On the use of multi-year ice ERS-1 σ<sub>o</sub> as a proxy indicator of melt period sea ice albedo.**

Thomas, A., Barber, D.G., *International journal of remote sensing*, Sep. 20, 1998, 19(14), p.2807-2821, 24 refs.

Climatology, Radiation balance, Ice cover effect, Sea ice, Albedo, Ice melting, Classifications, Seasonal variations, Synthetic aperture radar, Spaceborne photography, Backscattering, Models, Sensor mapping, Arctic Ocean

## 53-337

**Chemistry at the surfaces of ice and sulfuric acid: toward an understanding of adsorption at molecular solids.**

Roberts, J.T., *Accounts of chemical research*, July 1998, 31(7), p.415-421, 50 refs.

Climatology, Polar atmospheric clouds, Cloud physics, Ice physics, Amorphous ice, Surface structure, Monomolecular films, Ice vapor interface, Ice sublimation, Adsorption, Infrared spectroscopy, Simulation

53-338

**Comparative methods of estimating freezing temperatures and freezing injury in leaves of chaparral shrubs.**

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Plant physiology, Trees (plants), Plant tissues, Frost resistance, Freezing points, Damage, Supercooling, Temperature effects, Luminance, Viability, Statistical analysis, Cold weather survival

53-339

**Freezing tolerance of selected *Pennisetum* species.** Stair, D.W., Dahmer, M.L., Bashaw, E.C., Hussey, M.A., *International journal of plant sciences*, July 1998, 159(4), p.599-605, 35 refs.

Plant physiology, Grasses, Plant tissues, Cold tolerance, Frost resistance, Acclimatization, Electrical measurement, Cold weather tests, Simulation, Temperature effects

53-340

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Ice physics, Solidification, Nucleation rate, Freezing points, Cavitation, Bubbles, Oscillations, Luminescence, Sound waves, Ultrasonic tests

53-341

**Freeze-thaw durability of concretes with and without Class C fly ash.**

Quyang, C., Lane, O.J., Materials Engineering Conference, 4th, Washington, D.C., Nov. 10-14, 1996. Proceedings, Vol.2. Materials for the new millennium. Edited by K.P. Chong, New York, American Society of Civil Engineers, 1996, p.939-948, 4 refs. DLC TA401.3.M3762 1996 Vol.2

Concrete pavements, Concrete durability, Concrete admixtures, Modification, Porosity, Freeze thaw tests, Freeze thaw cycles, Thermal expansion, Air entrainment, Microstructure, Scanning electron microscopy

53-342

**Glaciers caused zooplankton mortality?**

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53-343

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Remote sensing, Sea ice, Radar echoes, Backscattering, Salt ice, Brines, Ice growth, Ice cover thickness, Statistical analysis, Models, Forecasting

53-344

**Aerial transport of keratinaceous substrate and distribution of the fungus *Geomyces pannorum* in antarctic soils.**

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Soil microbiology, Fungi, Ecology, Distribution, Sediment transport, Substrates, Particles, Decomposition, Nutrient cycle, Wind factors, Sampling, Antarctica—Signy Island

53-345

**Significance of ice sheet's leading-edge roughness in relation to ice load.**

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Ice solid interface, Sea ice, Offshore structures, Ice mechanics, Ice deformation, Ice loads, Ice edge, Surface roughness, Mechanical tests

53-346

**Laboratory simulation of wet icing buildup on H.V. insulators.**

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Power lines, Electrical insulation, Precipitation (meteorology), Wet snow, Ice accretion, Water content, Meltwater, Hoarfrost, Electrical resistivity, Ice solid interface, Snow cover effect, Cold weather performance, Simulation, Laboratory techniques

53-347

**Signature of the last shelf-centered glaciation at a key section in the Pechora basin, arctic Russia.**

Tveranger, J., Astakhov, V., Mangerud, J., Svendsen, J.I., *Journal of Quaternary science*, May-June 1998, 13(3), p.189-203, 41 refs.

Pleistocene, Glacial geology, Tectonics, Ice sheets, Quaternary deposits, Glacier oscillation, Moraines, Clays, Stratigraphy, Geochronology, Radioactive age determination, Russia—Pechora

53-348

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Pleistocene, Geological surveys, Marine geology, Quaternary deposits, Clays, Sedimentation, Paleogeology, Palynology, Stratigraphy, Lithology, Radioactive age determination, Baltic Sea

53-349

**Late Devensian glaciation of the eastern Llyn Peninsula, North Wales: evidence for terrestrial depositional environments.**

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Pleistocene, Ice sheets, Glacial deposits, Glacial geology, Glacier oscillation, Ice edge, Land ice, Landforms, Geomorphology, Stratigraphy, Quaternary deposits, Theories, United Kingdom—Wales

53-350

**Evidence for the occurrence of Vedde Ash in Sweden: radiocarbon and calendar age estimates.**

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Pleistocene, Paleoclimatology, Lacustrine deposits, Quaternary deposits, Sedimentation, Volcanic ash, Geochemistry, Geochronology, Radioactive age determination, Sweden

53-351

**Support for the Innuitian ice sheet in the Canadian High Arctic during the Last Glacial Maximum.**

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Pleistocene, Paleoclimatology, Ice sheets, Quaternary deposits, Glacial deposits, Glacier oscillation, Ice edge, Glacier thickness, Coalescence, Glacial geology, Geochronology, Theories, Canada—Northwest Territories—Ellesmere Island

53-352

**Energy balance over an alpine snowcover—point measurements and areal distribution.**

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Climatology, Alpine landscapes, Snow hydrology, Snowmelt, Albedo, Radiation balance, Surface energy, Heat flux, Turbulent boundary layer, Snow air interface, Snow cover effect, Wind factors, Models, Runoff forecasting, Switzerland—Alps

53-353

**Chemical studies of snow, ice and meltwaters from Naradu glacier area.**

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Glacial hydrology, Watersheds, Water chemistry, Glacier surveys, Surface drainage, Meltwater, Snow composition, Geochemistry, Weathering, Sampling, Ion density (concentration), Seasonal variations, Environmental tests, India

53-354

**Shackleton Glacier Project, 1995-1996.**

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Research projects, Low temperature research, Geological surveys, Glacier surveys, Antarctica—Transantarctic Mountains

53-355

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Geological surveys, Glacier surveys, Palynology, Glacial geology, Paleobotany, Antarctica—Shackleton Glacier

53-356

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Geological surveys, Glacier surveys, Glacial geology, Continental drift, Paleogeology, Antarctica—Transantarctic Mountains

53-357

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Geological surveys, Glacier surveys, Fossils, Glacial geology, Antarctica—Shackleton Glacier

53-358

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Geological surveys, Glacier surveys, Glacial geology, Stratigraphy, Fossils, Antarctica—Shackleton Glacier

53-359

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Geological surveys, Glacier surveys, Glacial geology, Glacial deposits, Antarctica—Shackleton Glacier

53-360

**Sub-Sirius Group erosion surface at Roberts Massif, upper Shackleton Glacier region, Transantarctic Mountains.**

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Geological surveys, Glacier surveys, Glacial geology, Glacial erosion, Antarctica—Roberts Massif

53-361

**Stratigraphy of the Sirius Group, upper Shackleton Glacier region, Transantarctic Mountains.**

Webb, P.N., Harwood, D.M., Hambrey, M.J., Krissek, L.A., Ashworth, A.C., Mabin, M.C.G., *Antarctic journal of the United States*, 1996, 31(2), p.16-17, 13 refs.

Geological surveys, Glacier surveys, Glacial geology, Stratigraphy, Antarctica—Shackleton Glacier

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Grunow, A., Encarnacion, J., Paulsen, T., Rowell, A.J., *Antarctic journal of the United States*, 1996, 31(2), p.18-19, 5 refs.

Geological surveys, Glacier surveys, Tectonics, Glacial geology, Geochronology, Rocks, Antarctica—Shackleton Glacier

53-363

**Geologic and thermochronologic studies along the front of the Transantarctic Mountains near the Shackleton and Liv Glaciers.**

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Geological surveys, Glacier surveys, Mapping, Glacial geology, Thermal properties, Antarctica—Transantarctic Mountains

53-364

**Structural and geomorphological observations at Cape Surprise, Shackleton Glacier area.**

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Geological surveys, Glacier surveys, Geomorphology, Glacial geology, Antarctica—Surprise, Cape

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**Lakes in dry valleys at 85°S near Mount Heekin, Shackleton Glacier.**

Elliot, D.H., Collinson, J.W., Green, W.J., *Antarctic journal of the United States*, 1996, 31(2), p.25-27.

Topographic surveys, Limnology, Deserts, Geomorphology, Water flow, Drainage, Geochemistry, Glacier surveys, Glacial lakes, Frozen lakes, Antarctica—McMurdo Dry Valleys

53-366

**Seed fern reproductive organs from the Shackleton Glacier area.**

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Geological surveys, Glacier surveys, Paleobotany, Plant physiology, Glacial deposits, Stratigraphy, Antarctica—Shackleton Glacier

53-367

**Permian and Triassic paleosols and paleoenvironments of the central Transantarctic Mountains, Antarctica.**

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Geological surveys, Glacial geology, Paleocology, Soil surveys, Stratigraphy, Soil classification, Soil chemistry, Soil formation, Antarctica—Transantarctic Mountains

53-368

**Paleoenvironment of the Triassic therapsid *Lystrorhynchus* in the central Transantarctic Mountains, Antarctica.**

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Geological surveys, Fossils, Paleocology, Soil surveys, Glacial geology, Stratigraphy, Antarctica—Transantarctic Mountains

53-369

**Late Triassic hummocky coals near Schroeder Hill, central Transantarctic Mountains, Antarctica.**

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Geological surveys, Glacial geology, Paleobotany, Paleoclimatology, Peat, Coal, Antarctica—Schroeder Hill

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**Geologic studies on rocks of the Jurassic Ferrar Group.**

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53-372

**Re-evaluation of the structure and stratigraphy of the Heritage Range, Ellsworth Mountains.**

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Geological surveys, Glacial geology, Stratigraphy, Geomorphology, Mapping, Continental drift, Antarctica—Heritage Range

53-373

**Future of the west antarctic ice sheet.**

Bindschadler, R., *Science*, Oct. 16, 1998, 282(5388), p.428-429, Refs. p.429.

Ice sheets, Sea level, Ice shelves, Mass balance, Antarctica—West Antarctica

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Moisture transfer, Glaciation, Ocean currents, Water temperature, Salinity, Paleoclimatology, Global change, Ice age theory, Arctic Ocean

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**North Atlantic oscillation dynamics recorded in Greenland ice cores.**

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Ice cores, Climatic changes, Greenland

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**Antarctic elevation change from 1992 to 1996.**

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Ice sheets, Altitude, Height finding, Mass balance, Antarctica

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Metals, Ice cores, Sea spray, Air masses, Marine atmospheres, Air pollution, Ice composition, Impurities, Antarctica—Law Dome

53-378

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Abyzov, S.S., et al., *Advances in space research*, Aug. 1998, 22(3), Life sciences: exobiology. Symposium of COSPAR Scientific Commission F. Proceedings, July 14-21, 1996, Birmingham, UK, p.363-368, 16 refs.

Ice sheets, Climate, Microbiology, Cryobiology, Antarctica—Vostok Station

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**Numerical simulations of wind deflection fins to control snow accumulation in building steps.**

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Snow accumulation, Simulation, Wind velocity, Mathematical models, Blowing snow, Snowdrifts, Windbreaks, Buildings

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Wind factors, Simulation, Buildings, Blowing snow, Snowdrifts, Antarctica—Charlie, Dome, Antarctica—Concordia Station

53-381

**Snow and wind experimental analysis in the design of long-span sub-horizontal structures.**

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Structural analysis, Snow loads, Wind pressure, Design criteria

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Pleistocene, Geocryology, Alluvium, Periglacial processes, Permafrost transformation, Clay minerals, Frozen ground mechanics, Desiccation, Mineralogy, Cryoturbation, Scanning electron microscopy, Russia—Siberia, Argentina

53-383

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**High-precision array element localization for vertical line arrays in the Arctic Ocean.**

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Oceanography, Underwater acoustics, Sound waves, Wave propagation, Sensors, Radio beacons, Velocity measurement, Analysis (mathematics), Orientation, Arctic Ocean

53-385

**Mitigation of rain and ice particle cross polarization at RF for dual circularly polarized waves.**

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Telecommunication, Electronic equipment, Radio waves, Anisotropy, Wave propagation, Polarization (waves), Precipitation (meteorology), Ice crystals, Ice dielectrics, Countermeasures, Design

53-386

**Sedimentology, palynostratigraphy, palynofacies and thermal maturity of Upper Permian rocks of Kolguev Island, Barents Sea, Russia.**

Grigoriev, M., Utting, J., *Bulletin of Canadian petroleum geology*, Mar. 1998, 46(1), p.1-11, With French summary. 32 refs.

Pleistocene, Geological surveys, Subpolar regions, Earth crust, Hydrocarbons, Sedimentation, Paleocology, Palynology, Stratigraphy, Correlation, Barents Sea

53-387

**Illite/smectite diagenesis in the Beaufort-Mackenzie Basin, arctic Canada: relation to hydrocarbon occurrence?**

Ko, J., Hesse, R., *Bulletin of Canadian petroleum geology*, Mar. 1998, 46(1), p.75-88, With French summary. 46 refs.

Marine geology, Subpolar regions, Hydrocarbons, Sedimentation, Exploration, Clays, Diagenesis, Drill core analysis, Lithology, Geothermy, Beaufort Sea, Canada—Northwest Territories—Mackenzie Basin

53-388

**AC and switching impulse performance of an ice-covered metal oxide surge arrester.**

Kannus, K., Lahti, K., Nonsiainen, K., *IEEE transactions on power delivery*, Oct. 1998, 13(4), p.1168-1173, 14 refs.

Power line icing, Electrical insulation, Ice accretion, Icicles, Ice solid interface, Ice cover effect, Charge transfer, Electrical resistivity, Thermal stresses, Countermeasures

53-389

**Broad spectral, interdisciplinary investigation of the electromagnetic properties of sea ice.**

Jezek, K.C., Perovich, D.K., MP 5225, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1633-1641, 30 refs.

Remote sensing, Sea ice, Geophysical surveys, Ice optics, Surface structure, Backscattering, Electromagnetic properties, Spectra, Models, Simulation, Research projects

This paper highlights the interrelationship of research completed by a team of investigators and presented in the several individual papers comprising this Special Section on the Office of Naval Research, Arlington, VA. Sponsored Sea Ice Electromagnetics Accelerated Research Initiative. The objectives of the initiative were the following: understand the mechanisms and processes that link the morphological and physical properties of sea ice to its electromagnetic (EM) characteristics; develop and verify predictive models for the interaction of visible, infrared, and microwave radiation with sea ice; and develop and verify inverse scattering techniques applicable to problems involving the interaction of EM radiation with sea ice. Along with describing results from experiments and modeling efforts, possible paradigms for using broad spectral data in developing algorithms for analyzing remote-sensing data in terms of ice concentration, age, type, and possibly thickness are briefly discussed.

53-390

**Evolution of electromagnetic signatures of sea ice from initial formation to the establishment of thick first-year ice.**

Grenfell, T.C., Gow, A.J., Perovich, D.K., MP 5226, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1642-1654, 38 refs.

Sea ice, Remote sensing, Ice optics, Radiometry, Backscattering, Young ice, Ice growth, Ice cover thickness, Electromagnetic properties, Statistical analysis, Spectra, Sensors, Correlation

The objective of the present work is to characterize the temporal evolution of the electromagnetic signatures of sea ice from initial formation through the development of first-year ice on the basis of the temporal variations in the physical properties of the ice. The time series of young sea ice signatures, including microwave emissivity, radar backscatter, and visible and infrared spectral albedo, has been measured at successive stages in the growth and development of sea ice, both under laboratory and field conditions. Mutually consistent theoretical models covering the entire wavelength range of the observations are applied to selected cases and successfully match the observations. Principal component analysis of the data set suggests combinations of the set of frequencies to effectively distinguish among different stages in the temporal evolution of the sea ice.

53-391

**Forward electromagnetic scattering models for sea ice.**

Golden, K.M., et al, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1655-1674, 100 refs.

Remote sensing, Sea ice, Ice dielectrics, Electromagnetic properties, Wave propagation, Scattering, Snow cover effect, Surface roughness, Ice models, Mathematical models, Theories

53-392

**Inverse electromagnetic scattering models for sea ice.**

Golden, K.M., et al, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1675-1704, 113 refs.

Remote sensing, Microwaves, Sea ice, Ice cover thickness, Ice microstructure, Ice dielectrics, Electromagnetic properties, Scattering, Brightness, Statistical analysis, Mathematical models, Theories

53-393

**Field observations of the electromagnetic properties of first-year sea ice.**

Perovich, D.K., et al, MP 5227, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1705-1715, 28 refs.

Remote sensing, Spaceborne photography, Sea ice, Ice optics, Electromagnetic properties, Albedo, Radar echoes, Microwaves, Backscattering, Ice microstructure, Snow cover effect, Simulation

An interdisciplinary field experiment was conducted during Apr. and May of 1994 at Point Barrow, AK, to investigate the relationship between the electromagnetic and physical-biological properties of first-year sea ice. Electromagnetic signatures of bare and snow-covered first-year ice were measured over a broad spectral range, including ultraviolet through near-infrared albedo, microwave emissivity, and radar backscatter. Observations indicated that the scattering of visible light varied significantly with depth in response to changes in the size and orientation of the ice crystals and in the number of brine and air inclusions. Passive microwave emissivities showed a substantial difference between snow-covered and snow-free sites due to the effects of impedance matching at lower frequencies and volume scattering at higher frequencies produced by the snow.

53-394

**Laboratory measurements of sea ice: connections to microwave remote sensing.**

Kwok, R., Gow, A.J., Perovich, D.K., MP 5228, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1716-1730, 35 refs.

Remote sensing, Sea ice, Young ice, Ice cover thickness, Electromagnetic properties, Spaceborne photography, Radar echoes, Backscattering, Polarization (waves), Simulation, Correlation

The connections between laboratory measurements and remote-sensing observations of sea ice are explored. The focus of this paper is on thin ice, which is more easily simulated in a laboratory environment. Results of C-band scatterometer measurements and their use in the interpretation of remote-sensing data are discussed. The potential of polarimetric radar measurements in the retrieval of thickness of thin ice and the importance of low-frequency passive measurements with respect to the thickness of thin ice are considered.

53-395

**Saline ice thickness retrieval under diurnal thermal cycling conditions.**

Shih, S.E., Ding, K.H., Kong, J.A., Nghiem, S.V., Jordan, A.K., *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1731-1742, 24 refs.

Remote sensing, Sea ice, Salt ice, Ice growth, Ice cover thickness, Heat flux, Electromagnetic properties, Radar echoes, Diurnal variations, Scattering, Mathematical models

53-396

**Modeling light propagation in sea ice.**

Mobley, C.D., Cota, G.F., Grenfell, T.C., Maffione, R.A., Pegau, W.S., Perovich, D.K., MP 5229, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1743-1749, 21 refs.

Remote sensing, Sea ice, Ice optics, Electromagnetic properties, Light scattering, Diffusion, Radiation absorption, Analysis (mathematics), Simulation, Forecasting

This paper outlines the process by which it is possible to begin with the physical properties of sea ice (such as the size distributions of brine pockets and air bubbles), then predict the optical absorption and scattering properties of the ice, and finally use these inherent

optical properties in radiative transfer models to predict light propagation within the ice. Each step of this entire process is illustrated by application to a comprehensive data set of sea ice physical and optical properties. Agreement is found between measured and modeled beam spread functions, albedos and transmittances.

53-397

**Role of snow on microwave emission and scattering over first-year sea ice.**

Barber, D.G., Perovich, D.K., Gow, A.J., MP 5230, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1750-1763, 22 refs.

Remote sensing, Sea ice, Young ice, Electromagnetic properties, Microwaves, Scattering, Snow optics, Snow electrical properties, Snow cover effect, Simulation, Thermodynamics, Models

The primary objective of this paper is to investigate the geophysical and thermodynamic effects of snow on sea ice in defining the electromagnetic interaction within the microwave portion of the spectrum. The authors combine observational evidence of both the physical and thermodynamic characteristics of snow with direct measurements of scattering and emission at a variety of frequencies. They explain observational results using various "state-of-the-art" forward scattering and emission models. The thermodynamic effects of snow on microwave scattering and emission are driven by the role that thermal diffusivity and conductivity play in the definition of brine volumes at the ice surface and within the snow volume. Once water in liquid phase appears within the snow cover, both emission and scattering are directly affected by the high complex permittivity of this volume fraction within the snow layer.

53-398

**Electromagnetic and physical properties of sea ice formed in the presence of wave action.**

Onstott, R.G., et al, MP 5231, *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1764-1783, 16 refs.

Remote sensing, Radiometry, Radar echoes, Backscattering, Sea ice, Young ice, Ice formation, Electromagnetic properties, Physical properties, Water waves, Classifications, Ice air interface, Simulation

In this paper, the physical and electromagnetic properties of sea ice, formed under wave-agitated conditions, are studied and compared with results obtained from ice formed under quiescent conditions. A variety of sensors, both active and passive, optical and microwave, were used to perform this characterization. Results showed that emission, backscatter, and albedo all take different signature paths during the transformation from saline water to young sea ice and that the paths depend on sea surface state during ice formation.

53-399

**Model for altimeter returns from penetrable geophysical media.**

Adams, R.J., Brown, G.S., *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1784-1793, 27 refs.

Remote sensing, Geophysical surveys, Ice sheets, Height finding, Radar echoes, Scattering, Surface roughness, Mathematical models, Snow cover effect

53-400

**Improved determination of the sea ice edge with SSM/I data for small-scale analysis.**

Hunewinkel, T., Markus, T., Heygster, G.C., *IEEE transactions on geoscience and remote sensing*, Sep. 1998, 36(5)pt.II, p.1795-1808, 33 refs.

Remote sensing, Sea ice, Ice surveys, Spaceborne photography, Radiometry, Ice edge, Detection, Accuracy, Models, Image processing, Antarctica—Weddell Sea

53-401

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Meteorological data, Snowdrifts, Blowing snow, Snowstorms, Ice needles, Air pollution, Ozone, Solar radiation, Antarctica—Showa Station, Antarctica—Dome Fuji Station

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Cold exposure, Cold weather survival, Manuals, Antarctica

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Mayewski, P.A., et al, Washington, D.C., National Science Foundation. Ice Core Working Group Draft, 1998, 47p., Refs. p.41-47.

Research projects, Ice cores, Global change, Paleoclimatology, Paleoecology, Climatic changes, Atmospheric composition, Human factors, Antarctica

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Harder, S.L., Seattle, University of Washington, 1996, 192p., University Microfilms order No.97-16849, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 57(12), p.7414.

Aerosols, Isotopes, Snow composition, Atmospheric composition, Snow air interface, Antarctica

53-406

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Frazer, T.K., Santa Barbara, University of California, 1995, 189p., University Microfilms order No.9617658, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 57(1), p.68.

Sea ice, Physiological effects, Animals, Plankton, Ecology, Biomass, Algae, Nutrient cycle, Antarctica

53-407

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Pollock, N.W., Tallahassee, Florida State University, 1996, 221p., University Microfilms order No.97-00221, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 57(8), p.4825.

Low temperature research, Acclimatization, Physiological effects, Cold tolerance, Cold stress, Health, Cold weather survival, Antarctica

53-408

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Quakenbush, T.K., Fairbanks, University of Alaska, 1994, 115p., University Microfilms order No.9529959, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 56(4), p.2082.

Sea ice, Ice optics, Snow optics, Ultraviolet radiation, Light (visible radiation), Ozone, Atmospheric physics, Algae, Photosynthesis, Antarctica

53-409

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International cooperation, Sea ice, Ice conditions, Research projects, Cost analysis, Icebergs, Ice detection, Ice forecasting, Ice reporting

53-410

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53-411

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Spacecraft, Imaging, Remote sensing, Sea ice, Ice conditions, Mapping, Antarctica

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Snow composition, Atmospheric composition, Firn, Ice composition, Atmospheric physics, Antarctica

53-413

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Sea ice distribution, Ice conditions, Imaging, Mathematical models, Remote sensing, Polar regions, Atmospheric attenuation, Mapping, Spaceborne photography

53-414

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53-415

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Pleistocene, Paleoclimatology, Climatic changes, Paleoecology, Glacial geology, Glacial deposits, Lacustrine deposits, Quaternary deposits, Stratigraphy, Correlation, United States

53-416

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Pleistocene, Paleoclimatology, Climatic changes, Glacial geology, Glacier oscillation, Ice edge, Periodic variations, Geochronology, Correlation, Antarctica—McMurdo Sound

53-417

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DLC QC884.P58

Pleistocene, Paleoclimatology, Glacial geology, Mountain glaciers, Glaciation, Ice age theory, United States—Hawaii—Mauna Kea

53-418

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53-419

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53-420

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Pleistocene, Subpolar regions, Earth crust, Geologic structures, Tectonics, Deformation, Stratigraphy, Seismic reflection, Exploration, Canada—Northwest Territories—Colville Hills

53-421

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53-422

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53-423

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53-424

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Pleistocene, Geochronology, Earth crust, Tectonics, Volcanoes, Magma, Geologic processes, Stratigraphy, Radioactive isotopes, Isotope analysis, Radioactive age determination, Greenland

53-425

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53-426

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53-428

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53-429

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53-431

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53-432

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53-433

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53-434

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Frozen ground thermodynamics, Heat pipes, Heat transfer, Soil freezing, Artificial freezing, Permafrost physics, Cold storage, Temperature control, Design, Mechanical tests

53-436

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53-437

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53-438

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53-439

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53-440

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53-441

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Geomorphology, Mountains, Slope processes, Avalanches, Landslides, Rock streams, Periglacial processes, Quaternary deposits, Age determination, United States—Montana—Glacier National Park

53-442

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53-443

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Geomorphology, Mountains, Glacial geology, Moraines, Slope stability, Glacial erosion, Snowmelt, Solifluction, Weathering, Safety, Spain—Sierra de Gredos



## 53-444

**Proceedings. POAC 95. Volume 4.** International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995, St. Petersburg, Russia, 1995, 249p., Refs. passim. For individual papers see 53-445 through 53-464. For Vols. 1 and 2 see 49-6227 through 49-6267; for Vol. 3 see 52-6678 through 52-6706.

Ice navigation, Icebreakers, Ice conditions, Sea ice, Ice cover, Ice solid interface, Tanker ships, Marine transportation, Northern Sea Route

## 53-445

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Marine transportation, Ice navigation, Economic analysis, Ice conditions, Sea ice, Icebreakers, Tanker ships, Northern Sea Route

## 53-446

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## 53-447

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## 53-448

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Ice loads, Offshore structures, Ice solid interface, Ice floes, Analysis (mathematics), Strains, Loads (forces), United States—Alaska—Cook Inlet

## 53-449

**New ice breaking tanker concept for the Arctic (DAT).**

Juurmaa, K., Wilkman, G., Bäckström, M., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol. 4, St. Petersburg, Russia, 1995, p. 62-71. Icebreakers, Tanker ships, Design, Design criteria

## 53-450

**Ice forces on a downward-breaking conical structure from partially consolidated rubble ice.**

Sodhi, D.S., MP 5232, International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol. 4, St. Petersburg, Russia, 1995, p. 72-83, 3 refs.

Ice loads, Ice solid interface, Ice models, Offshore structures, Flexural strength, Tests  
Model tests were conducted to determine the forces that are generated during interaction between partially consolidated rubble ice and a downward-breaking conical structure. The model structure broke ice in flexure when the ice contacted the structure at a sloping surface. Other failure modes were observed when the ice contacted vertical surfaces, resulting in high ice forces. The ice forces measured during model tests are presented. These forces compare well with those predicted by theoretical models. No ice jamming was observed during the model tests.

## 53-451

**Application of results from the research project "A Ship in Compressive Ice" to ship operability.**

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Ice navigation, Sea ice, Compressive properties, Ice solid interface, Ice cover strength, Ships, Ice pressure, Mathematical models, Ice models

## 53-452

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Ships, Icebreakers, Classifications, Design criteria, Design

## 53-453

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Salinity, Sea water, Atmospheric pressure, Water temperature, Ocean currents, Barents Sea, Russia—Kara Sea, Russia—Baydaratskaya Bay

## 53-454

**New development in modelling technology of first-year ridges.**

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Pressure ridges, Ice models, Shear strength, Tanker ships, Ice solid interface, Simulation

## 53-455

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Marine transportation, Ice navigation, Economic analysis, Icebreakers, Tanker ships, Northern Sea Route

## 53-456

**Kara Sea ice-ocean coupled model.**

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Ice water interface, Ice models, Sea ice, Mathematical models, Ocean currents, Ice cover thickness, Thermodynamics, Russia—Kara Sea

## 53-457

**Modelling of interaction between icebreaking crafts and ice in composite model ice.**

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Ice solid interface, Ships, Air cushion vehicles, Ice models, Ice breaking, Mathematical models

## 53-458

**Exploration of the ice cover in the Pechora Sea as related to shelf development.**

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Ice cover, Offshore drilling, Sea ice, Ice floes, Fracturing, Hummocks, Ice surveys, Marine geology, Exploration, Barents Sea

## 53-459

**Method for calculation of flow action of the screw on bottom in the port water basin in process on mooring tests of ship.**

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Propellers, Ships, Analysis (mathematics), Moorings

## 53-460

**Usage of ice heat cutting in mines and leads in ice cover.**

Morev, V.A., Savatugin, L.M., Potapenko, V.I.U., International Conference on Port and Ocean Engineering under Arctic Conditions, 13th, Murmansk, Russia, Aug. 15-18, 1995. Proceedings. POAC 95. Vol. 4, St. Petersburg, Russia, 1995, p. 194-203, 4 refs.

Ice cutting, Heating, Heat transfer, Equipment, Design, Artificial melting, Thermal drills

## 53-461

**Mathematical modelling and navigation safety along the Northern Sea Route.**

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Safety, Marine transportation, Ice navigation, Mathematical models, Northern Sea Route, Russia—Kara Sea, Russia—Ob', Gulf

## 53-462

**Local and interactive effects of ice failure at ship motion in a compressive ice.**

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Ice solid interface, Sea ice, Compressive properties, Icebreakers, Mathematical models, Ice cover strength, Fracturing

## 53-463

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Sea ice, Microwaves, Ice microstructure, Countermeasures, Ice cover strength, Ice solid interface, Ice breaking

## 53-464

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Icebreakers, Ships, Marine transportation, Design, Design criteria

53-465

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Carbon isotopes, Suspended sediments, Sea ice, Ice composition, Sea water, Surface waters, Marine biology, Antarctica—Ross Sea

53-466

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Electric fields, Atmospheric electricity, Diurnal variations, Seasonal variations, Global change, Global warming, Antarctica—Amundsen-Scott Station

53-467

**Model/measurement comparisons of ozone-depleting chlorine chemistry in the polar stratosphere.**

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Ozone, Stratosphere, Atmospheric composition, Models, Air pollution, Polar stratospheric clouds, Antarctica—McMurdo Station

53-468

**Heat balance of West Antarctic ice streams, investigated with a numerical model of coupled ice sheet, ice stream, and ice shelf flow.**

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Heat balance, Mathematical models, Ice sheets, Ice shelves, Streams, Flow measurement, Ice melting, Glaciology, Glacier flow, Glacier heat balance, Glacier melting, Antarctica—West Antarctica

53-469

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Ozone, Atmospheric composition, Stratosphere, Meteorological factors, Air masses, Polar regions, Atmospheric disturbances

53-470

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Plankton, Biomass, Marine biology, Nutrient cycle, Sea ice distribution, Ice cover effect, Oceanographic surveys, Wind factors, Solar radiation, Photosynthesis, Antarctica

53-471

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Glaciology, Ice cores, Geochemistry, Air masses, Ice composition, Paleoclimatology, Climatic changes, Antarctica—West Antarctica

53-472

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Environmental protection, Legislation, International cooperation, Environmental impact, Organizations

53-473

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Infrared radiation, Spectroscopy, Air masses, Models, Climatology, Air temperature, Polar atmospheres, Radiation balance, Antarctica—Amundsen-Scott Station

53-474

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Mars (planet), Extraterrestrial ice, Ground ice, Regolith, Plains, Tectonics, Frozen ground mechanics, Landscape development, Rheology, Models

53-475

**Evolution of ice surfaces within porous near-surface layers on cometary nuclei.**

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Extraterrestrial ice, Ice physics, Ice sublimation, Ice surface, Ice erosion, Surface properties, Porosity, Dust, Vapor diffusion, Ice vapor interface, Mathematical models

53-476

**Puzzling detection of the 22 GHz water emission line in Comet Hyakutake at perihelion.**

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Remote sensing, Cosmic dust, Extraterrestrial ice, Molecular energy levels, Ice detection, Ice sublimation, Spectroscopy, Spectra

53-477

**Frequency of debris flows on the Sheep Mountain fan, Kluane Lake, Yukon Territory.**

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Geomorphology, Slope processes, Subarctic landscapes, Paleocology, Mass flow, Talus, Rock streams, Gullies, Classifications, Clay minerals, Sediment transport, Stratigraphy, Profiles, Canada—Yukon Territory—Sheep Mountain

53-478

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DLC G70.5.P73 C57 1996

Climatology, Subpolar regions, Remote sensing, Spaceborne photography, Synthetic aperture radar, Radiometry, Geophysical surveys, Glacier surveys, Sea ice distribution, Ice surveys, Vegetation patterns, Classifications, Image processing, Statistical analysis

53-479

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Parlow, E., Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Proceedings and European Space Agency. Special publication No.391, Noordwijk, European Space Agency, 1996, p.27-33, 19 refs.

DLC G70.5.P73 C57 1996

Climatology, Remote sensing, LANDSAT, Glacial hydrology, Glacier surfaces, Spaceborne photography, Radiation balance, Mathematical models, Topographic effects, Snow cover effect, Image processing, Norway—Spitsbergen

53-480

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Microclimatology, Plant ecology, Radiometry, Subpolar regions, Surface energy, Heat flux, Radiation balance, Statistical analysis, Correlation, Indexes (ratios), Greenland

53-481

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DLC G70.5.P73 C57 1996

Climatology, Precipitation (meteorology), Spaceborne photography, Radiometry, Cloud cover, Snow cover, Detection, Data processing, Infrared radiation, Image processing, Classifications

53-482

**Glacier mapping and inventory of the Illecillewaet River basin, British Columbia, Canada, using LANDSAT TM and digital elevation data.**

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DLC G70.5.P73 C57 1996

Remote sensing, Glacier surveys, Glacier surfaces, Sensor mapping, LANDSAT, Spaceborne photography, Altitude, Image processing, Correlation, Classifications, Canada—British Columbia—Illecillewaet River

53-483

**Geostatistical approaches to interpolation and classification of remote sensing data from ice surfaces.**

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DLC G70.5.P73 C57 1996

Remote sensing, Glacier surveys, Glacier surfaces, Glacier surges, Sensor mapping, Synthetic aperture radar, Classifications, Data processing, Statistical analysis, United States—Alaska—Bering Glacier



## 53-484

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Remote sensing, Glacier surveys, Surface properties, Glacier mass balance, Glacier oscillation, Synthetic aperture radar, Sensor mapping, Spaceborne photography, Profiles, Correlation, Norway—Svalbard

## 53-485

**LANDSAT TM-data and ground radiometer measurements for snow and ice type classification in the Vestfold Hills, East Antarctica.**

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Remote sensing, Glacier surveys, LANDSAT, Colored ice, Snow cover, Glacier surfaces, Radiometry, Snow optics, Sensor mapping, Spaceborne photography, Classifications, Spectra, Antarctica—Vestfold Hills

## 53-486

**New results from mapping Antarctica at high resolution from radar altimeter data.**

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Remote sensing, Glacier surveys, Ice sheets, Spacecraft, Geodetic surveys, Topographic maps, Height finding, Sensor mapping, Radar echoes, Antarctica

## 53-487

**Image analysis by geostatistical and neural-network methods—applications in glaciology.**

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Remote sensing, Spaceborne photography, Glacier surveys, Glacier surfaces, Glacier surges, Surface structure, Classifications, Image processing, Statistical analysis, Ice mechanics, United States—Alaska—Bering Glacier

## 53-488

**Early results of the use of RADARSAT ScanSAR data in the Canadian Ice Service.**

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Remote sensing, Spaceborne photography, Synthetic aperture radar, Sea ice, Ice conditions, Marine transportation, Ice surveys, Ice reporting, Image processing, Data processing, Canada—Labrador

## 53-489

**Sea ice drift in the East Greenland Current.**

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Oceanographic surveys, Spaceborne photography, Radiometry, Brightness, Ocean currents, Sea ice distribution, Drift, Velocity measurement, Seasonal variations, Greenland

## 53-490

**Ice edge determination in the Greenland waters using first order texture parameters of the ERS-SAR images.**

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Remote sensing, Ice surveys, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Sea ice distribution, Ice conditions, Ice edge, Image processing, Statistical analysis, Classifications, Greenland

## 53-491

**Sea ice characteristics and backscatter variability in the Bellingshausen Sea, Antarctica.**

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Remote sensing, Ice surveys, Spaceborne photography, Radiometry, Synthetic aperture radar, Sea ice distribution, Ice growth, Surface roughness, Backscattering, Seasonal variations, Snow cover effect, Arctic Ocean, Antarctica—Bellingshausen Sea

## 53-492

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Remote sensing, Sea ice distribution, Ice surveys, Spaceborne photography, Synthetic aperture radar, Classifications, Resolution, Correlation

## 53-493

**Arctic Ocean melt season characteristics and sea ice melt pond fractions using ERS-1 SAR.**

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Remote sensing, Sea ice, Ice surveys, Spaceborne photography, Synthetic aperture radar, Ice melting, Ice surface, Ponds, Seasonal freeze thaw, Backscattering, Image processing, Seasonal variations, Beaufort Sea

## 53-494

**Air monitoring of ice conditions in the arctic seas.**

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Remote sensing, Imaging, Sea ice distribution, Drift, Ice surveys, Aerial surveys, Ice conditions, Ice reporting, Ice navigation, Arctic Ocean

## 53-495

**Lithologic mapping by field and satellite multi-spectral data, Tarn Flat, Antarctica.**

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Remote sensing, Glacial geology, Glacial deposits, Spaceborne photography, Sediments, Rock properties, Lithology, Classifications, Image processing, Spectra, Antarctica—Terra Nova Bay

## 53-496

**Quantitative mapping of active aeolian surfaces in northern Fennoscandia—LANDSAT TM hybrid classification.**

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Remote sensing, Spaceborne photography, LANDSAT, Subpolar regions, Geophysical surveys, Soil surveys, Eolian soils, Sensor mapping, Image processing, Classifications, Sweden, Finland

## 53-497

**Use of SAR data to study active volcanoes in Alaska.**

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Geophysical surveys, Remote sensing, Spaceborne photography, Synthetic aperture radar, Subpolar regions, Landforms, Volcanoes, Explosion effects, Detection, United States—Alaska—Westdahl Volcano

## 53-498

**Mapping plant communities in a local arctic landscape applying scanned infrared aerial photographs in a geographic information system.**

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Remote sensing, Plant ecology, Geophysical surveys, Vegetation patterns, Subpolar regions, Sensor mapping, Spaceborne photography, Infrared photography, Classifications, Norway—Svalbard

## 53-499

**Summer environmental mapping applications of a large-scale mosaic of the state of Alaska generated from ERS-1 SAR images.**

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Remote sensing, Landforms, Surface structure, Topographic features, Subpolar regions, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Image processing, United States—Alaska

## 53-500

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Remote sensing, Spaceborne photography, Synthetic aperture radar, Tundra terrain, Lake ice, Ice growth, Icebound lakes, Ice cover thickness, Water level, Mathematical models, Water supply, United States—Alaska

53-501

**Forest biomass estimation in northern Europe using NOAA AVHRR data.**

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DLG G70.5.P73 C57 1996

Remote sensing, Forest ecosystems, Biomass, Arctic landscapes, Spaceborne photography, Radiometry, Classifications, Sensor mapping, Finland

53-502

**Seasonal snow of arctic Alaska R4D investigations. Final report.**

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Snow accumulation, Snow physics, Wind factors, Snowdrifts, Blowing snow, Snow heat flux, Snow composition, Snow air interface, United States—Alaska—North Slope

53-503

**Structural tailoring of aircraft engine blade subject to ice impact constraints.**

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Aircraft icing, Ice loads, Aircraft, Design, Materials, Propellers, Impact tests

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Shevchenko, V.V., Solar system research, July-Aug. 1998, 32(4), p.272-275, Translated from Astronomicheskii vestnik. 13 refs.

Extraterrestrial ice, Satellites (natural), Spacecraft, Spectroscopy, Ice detection, Moon, Polar regions, Ground ice, Sedimentation, Impact

53-505

**Estimation of source parameters and  $Q$  from acceleration recorded in the Vatnafjöll earthquake in south Iceland.**

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Earthquakes, Tectonics, Subpolar regions, Seismic surveys, Seismic velocity, Wave propagation, Spectra, Attenuation, Origin, Statistical analysis, Mathematical models, Iceland

53-506

**Study of low-magnitude seismic events near the Novaya Zemlya nuclear test site.**

Ringdal, F., Seismological Society of America. Bulletin, Dec. 1997, 87(6), p.1563-1575, 22 refs.

Seismic surveys, Subpolar regions, Nuclear explosions, Tests, Earthquakes, Detection, Wave propagation, Classifications, Origin, Recording, Russia—Novaya Zemlya

53-507

**Determination of glacial till specific storage in North Dakota.**

Shaver, R.B., Ground water, July-Aug. 1998, 36(4), p.552-557, 16 refs.

Ground water, Hydrogeology, Glacial geology, Clay soils, Glacial deposits, Water storage, Saturation, Permeability, Drill core analysis, United States—North Dakota

53-508

**Reductive dissolution and reactive solute transport in a sewage-contaminated glacial outwash aquifer.**

Lee, R.W., Bennett, P.C., Ground water, July-Aug. 1998, 36(4), p.583-595, 25 refs. Hydrogeochemistry, Soil microbiology, Ground water, Sewage disposal, Water pollution, Metals, Solubility, Diffusion, Glacial geology, Glacial deposits, Outwash, Sampling, Environmental tests, United States—Massachusetts

53-509

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Tectonics, Subpolar regions, Seismic surveys, Earthquakes, Volcanoes, Magma, Wave propagation, Detection, Orientation, Iceland—Bárðarbunga Volcano

53-510

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53-511

**Early Paleozoic orogenic collapse, tectonic stability, and late Paleozoic continental rifting revealed through thermochronology of K-feldspars, southern Norway.**

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Pleistocene, Tectonics, Subpolar regions, Earth crust, Continental drift, Sediments, Radioactive isotopes, Radioactive age determination, Geochronology, Statistical analysis, Norway

53-512

**Tectonically versus climatically driven Cenozoic exhumation of the Eurasian plate margin, Svalbard: fission track analyses.**

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Pleistocene, Paleoclimatology, Tectonics, Subpolar regions, Earth crust, Stratigraphy, Profiles, Geothermy, Lithology, Radioactive isotopes, Geochronology, Norway—Svalbard

53-513

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Forest soils, Ecosystems, Nutrient cycle, Natural gas, Soil air interface, Soil chemistry, Soil microbiology, Taiga, Geochemical cycles, Sampling, United States—Alaska—Bonanza Creek Experimental Forest

53-514

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Ice physics, Ice sheets, Ice cores, Ice structure, Bubbles, Hydrates, Clathrates, Ice air interface, Vapor diffusion, Phase transformations, Thermodynamics, Mathematical models

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53-516

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53-517

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Climatology, Climatic changes, River basins, River flow, Wetlands, Precipitation (meteorology), Snowmelt, Surface drainage, Forecasting, Geochemical cycles, Mathematical models, Simulation, Canada—Nova Scotia, Canada—Newfoundland, Canada—New Brunswick

53-518

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Cloud physics, Synoptic meteorology, Aircraft icing, Fronts (meteorology), Atmospheric pressure, Classifications, Ice forecasting, Statistical analysis, Weather observations, Correlation

53-519

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Aircraft icing, Classifications, Ice forecasting, Weather forecasting, Temperature effects, Mathematical models, Models, Imaging, Simulation, Statistical analysis, Correlation, Accuracy

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Aircraft icing, Cloud physics, Ice forecasting, Ice formation, Diurnal variations, Weather forecasting, Mathematical models, Statistical analysis, Accuracy, Correlation

53-521

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Ice physics, Molecular structure, Molecular energy levels, Ice dielectrics, Polarization (charge separation), Hydrogen bonds, Ice crystal optics, Proton transport, Vibration, Spectra, Computerized simulation

53-522

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Tison, J.L., Souchez, R., Wolff, E.W., Moore, J.C., Legrand, M.R., De Angelis, M., Journal of geophysical research, Aug. 20, 1998, 103(D15), p.18,885-18,894, 34 refs.

Ice sheets, Ice cores, Ice composition, Bottom ice, Paleocology, Geochemical cycles, Bacteria, Degradation, Periglacial processes, Dielectric properties, Electrical measurement, Profiles, Greenland

## 53-523

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Novelli, P.C., Masarie, K.A., Lang, P.M., *Journal of geophysical research*, Aug. 20, 1998, 103(D15), p.19,015-19,033, 62 refs.

Climatology, Atmospheric composition, Gases, Distribution, Polar atmospheres, Atmospheric boundary layer, Sampling, Statistical analysis, Correlation, Seasonal variations, Canada—Northwest Territories—Alert, United States—Alaska—Barrow, Iceland—Vestmannaeyjar, Antarctica—Palmer Station, Antarctica—South Pole, Antarctica—Showa Station

## 53-524

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Climatology, Atmospheric composition, Polar atmospheres, Air masses, Air pollution, Aerosols, Particles, Carbon black, Sampling, Seasonal variations, Statistical analysis, United States—Alaska—Northwest Alaska Areas National Park, United States—Alaska—Gates of the Arctic National Park, United States—Alaska—Bering Land Bridge National Preserve

## 53-525

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Climatology, Polar atmospheres, Air pollution, Atmospheric composition, Aerosols, Carbon black, Particles, Soil chemistry, Seasonal variations, Origin, Sampling, Statistical analysis, United States—Alaska—Northwest Alaska Areas National Park, United States—Alaska—Gates of the Arctic National Park, United States—Alaska—Bering Land Bridge National Park

## 53-526

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Climatology, Polar atmospheres, Optical properties, Aerosols, Volcanic ash, Sounding, Infrared spectroscopy, Spectra, Scattering, Particle size distribution, Attenuation, Statistical analysis, Sweden—Kiruna

## 53-527

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Climatology, Polar atmospheres, Stratosphere, Photometry, Atmospheric composition, Ozone, Degradation, Profiles, Seasonal variations, Models

## 53-528

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Climatology, Atmospheric composition, Subpolar regions, Air pollution, Atmospheric boundary layer, Turbulent diffusion, Gases, Photochemical reactions, Spectroscopy, Sampling, Diurnal variations, United States—Alaska—Barrow

## 53-529

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Geothermy, Earth crust, Subpolar regions, Geological maps, Temperature gradients, Quaternary deposits, Permafrost bases, Thermal conductivity, Thermal regime, Boreholes, Coal, Canada—Northwest Territories—Sverdrup Basin

## 53-530

**Thermal properties of granulite facies rocks in the Precambrian basement of Finland and Estonia.**

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Geothermy, Earth crust, Subpolar regions, Lithology, Thermal conductivity, Seismic velocity, Rock properties, Thermal properties, Mineralogy, Sampling, Statistical analysis, Finland, Estonia

## 53-531

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Pleistocene, Paleoclimatology, Geothermy, Heat flux, Advection, Surface temperature, Well logging, Temperature inversions, Thermal diffusion, Mathematical models, Ice age theory, Accuracy

## 53-532

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Kukkonen, I.T., Gosnold, W.D., Safanda, J., *Tectonophysics*, June 15, 1998, 291(3-4), International Workshop on Heat Flow and the Structure of the Lithosphere, 4th, Trest, Southern Bohemia, Czech Republic, June 9-15, 1996. Selected papers. Edited by V. Cermák, p.235-249, 49 refs.

Geothermy, Pleistocene, Paleoclimatology, Earth crust, Boreholes, Subpolar regions, Heat flux, Temperature gradients, Profiles, Statistical analysis, Simulation, Russia—Karelia

## 53-533

**Wind-forced upwelling and internal Kelvin wave generation in Mackenzie Canyon, Beaufort Sea.**

Carmack, E.C., Kulikov, E.A., *Journal of geophysical research*, Aug. 15, 1998, 103(C9), p.18,447-18,458, 26 refs.

Oceanography, Subpolar regions, Ocean currents, Upwelling, Hydrography, Wind direction, Wind factors, Bottom topography, Topographic effects, Wave propagation, Spectra, Beaufort Sea

## 53-534

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Oceanography, Subpolar regions, Ocean currents, Heat flux, Water temperature, Temperature distribution, Convection, Salinity, Hydrography, Profiles, Seasonal variations, Greenland Sea

## 53-535

**Sulfate and nitrate firn concentrations on the Greenland ice sheet. 1. Large-scale geographical deposition changes.**

Fischer, H., Wagenbach, D., Kipfstuhl, J., *Journal of geophysical research*, Sep. 20, 1998, 103(D17), p.21,927-21,934, 38 refs.

Climatology, Ice sheets, Aerosols, Sedimentation, Distribution, Firn, Snow accumulation, Snow impurities, Glacial meteorology, Ice cores, Profiles, Seasonal variations, Mathematical models, Greenland

## 53-536

**Sulfate and nitrate firn concentrations on the Greenland ice sheet. 2. Temporal anthropogenic deposition changes.**

Fischer, H., Wagenbach, D., Kipfstuhl, J., *Journal of geophysical research*, Sep. 20, 1998, 103(D17), p.21,935-21,942, 23 refs.

Climatology, Air pollution, Ice sheets, Ice cores, Firn, Snow accumulation, Hydrocarbons, Aerosols, Sedimentation, Origin, Mathematical models, Greenland

## 53-537

**Polar stratospheric clouds climatology over Dumont d'Urville between 1989 and 1993 and the influence of volcanic aerosols on their formation.**

David, C., Bekki, S., Godin, S., Mégie, G., Chipperfield, M.P., *Journal of geophysical research*, Sep. 20, 1998, 103(D17), p.22,163-22,180, 66 refs.

Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Aerosols, Volcanic ash, Hydrates, Condensation nuclei, Classifications, Lidar, Backscattering, Profiles, Antarctica—Dumont d'Urville Station

## 53-538

**Sequestration of HNO<sub>3</sub> in polar stratospheric clouds and chlorine activation as monitored by ground-based Fourier transform infrared solar absorption measurements.**

Wegner, A., Stiller, G.P., Von Clarmann, T., Maucher, G., Blumenstock, T., Thomas, P., *Journal of geophysical research*, Sep. 20, 1998, 103(D17), p.22,181-22,200, 57 refs.

Climatology, Polar atmospheres, Atmospheric composition, Subsidence, Cloud physics, Polar stratospheric clouds, Aerosols, Ozone, Infrared spectroscopy, Sounding, Spectra, Sweden—Kiruna

## 53-539

**Polycyclic aromatic hydrocarbons (PAHs) in antarctic Martian meteorites, carbonaceous chondrites and polar ice.**

Becker, L., Glavin, D.P., Bada, J.L., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.36-50, 38 refs.

DLC QR130.I56 1997

Hydrocarbons, Sediments, Ice sheets, Ice cores, Ice composition, Ice sublimation, Meltwater, Impurities, Organic nuclei, Mars (planet), Chemical analysis, Correlation, Antarctica—Allan Hills

## 53-540

**Simple techniques for detection of Martian microorganisms.**

Sims, M.R., Cole, R.E., Grant, W.D., Mills, A.A., Powell, K., Ruffles, R.W., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.164-174, 13 refs.

DLC QR130.I56 1997

Exploration, Mars (planet), Regolith, Life (durability), Microbiology, Detection, Permafrost structure, Samplers, Instruments, Design, Explosion effects

53-541

**Europa Ocean Discovery mission.**

Edwards, B.C., et al, *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.249-261, 32 refs.

DLC QR130.I56 1997

Extraterrestrial ice, Satellites (natural), Oceans, Detection, Ice water interface, Subglacial observations, Spacecraft, Remote sensing, Exploration, Design

53-542

**Testing for evolutionary trends of European biota.**

Chela-Flores, J., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.262-271, 33 refs.

DLC QR130.I56 1997

Life (durability), Microbiology, Algae, Detection, Extraterrestrial ice, Satellites (natural), Exploration, Spacecraft, Design, Origin

53-543

**Permafrost as a microbial habitat: extreme for the Earth, favorable in space.**

Gilichinski, D.A., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.472-480, 34 refs.

DLC QR130.I56 1997

Extraterrestrial ice, Satellites (natural), Ground ice, Permafrost physics, Preserving, Microbiology, Ecosystems, Detection, Life (durability), Viability, Models

53-544

**Characteristics of ice-active substances released by sea ice diatoms.**

Raymond, J.A., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.482-489, 4 refs.

DLC QR130.I56 1997

Microbiology, Sea ice, Ice physics, Chemical composition, Cryobiology, Algae, Adsorption, Ice crystal growth, Ice crystal structure, Extraterrestrial ice, Simulation, Antarctica—McMurdo Sound

53-545

**Searching for ice and ocean biogenic activity on Europa and Earth.**

Horvath, J., et al, *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3111, Instruments, methods, and missions for the investigation of extraterrestrial microorganisms. Edited by R.B. Hoover, p.490-500, 16 refs.

DLC QR130.I56 1997

Exploration, Microbiology, Cryobiology, Spacecraft, Glacier ice, Extraterrestrial ice, Satellites (natural), Probes, Detection, Simulation

53-546

**Oceanographic conditions east of Iceland.**

Perkins, H., Hopkins, T.S., Malmberg, S.A., Poulain, P.M., Warn-Varnas, A., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,531-21,542, 30 refs.

Oceanography, Subpolar regions, Ocean currents, Hydrography, Flow measurement, Classifications, Velocity measurement, Boundary layer, Statistical analysis, Iceland—Iceland-Faeroe Ridge

53-547

**On the variability of Baltic Sea deepwater mixing.**

Axell, L.B., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,667-21,682, 40 refs.

Oceanography, Subpolar regions, Ocean currents, Hydrography, Gravity waves, Turbulent diffusion, Wind factors, Boundary layer, Seasonal variations, Mathematical models, Topographic effects, Baltic Sea

53-548

**Bio-optical properties of the southwestern Ross Sea.**

Arrigo, K.R., Robinson, D.H., Worthen, D.L., Schieber, B., Lizotte, M.P., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,683-21,695, 30 refs.

Oceanography, Marine biology, Biomass, Plankton, Polynyas, Sea water, Chlorophylls, Particles, Optical properties, Spectroscopy, Reflectivity, Attenuation, Radiation absorption, Antarctica—Ross Sea

53-549

**5-year satellite climatology of winter sea ice leads in the western Arctic.**

Miles, M.W., Barry, R.G., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,723-21,734, 42 refs.

Climatology, Sea ice distribution, Spaceborne photography, Ice openings, Ice deformation, Surface structure, Orientation, Shear properties, Seasonal variations, Statistical analysis, Arctic Ocean

53-550

**Observations of brine drainage networks and microstructure of first-year sea ice.**

Cole, D.M., Shapiro, L.H., MP 5233, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,739-21,750, 34 refs.

Sea ice, Ice mechanics, Ice microstructure, Brines, Subsurface drainage, Channels (waterways), Ice water interface, Porosity, Physical properties, Thin sections, Chukchi Sea

Brine drainage networks and the microstructure of first-year sea ice have been examined at two locations near Barrow, northern Alaska. A method for obtaining full-depth sections of ice sheets up to 1.8 m thick is presented and shown to provide information on the spatial distribution and geometry of brine drainage networks on a scale of meters. A number of such sections from the two test sites are presented which reveal a greater variety of main channel and side branch configurations than is typically observed in ice grown in the laboratory. Vertical and horizontal micrographs and thin section photographs were obtained at a test site in the relatively protected Elson Lagoon. The resulting time series of photographic records provide detailed information on the size, shape and spatial distribution of the brine- and gas-filled inclusions and a means to quantify their size and shape changes with time. An example of the changes with time in inclusion sizes and aspect ratios in the vertical and horizontal directions for a depth of 0.2 m, with a given thermal history is also presented.

53-551

**Cyclic loading and creep response of aligned first-year sea ice.**

Cole, D.M., Johnson, R.A., Durell, G.D., MP 5234, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,751-21,758, 31 refs.

Sea ice, Ice mechanics, Ice strength, Ice cores, Elastic properties, Ice creep, Dynamic loads, Shear modulus, Orientation, Mechanical tests, Ice solid interface, Ice models

Characteristics such as brine and gas porosity and crystallographic features can have a profound impact on the mechanical properties of first-year sea ice. A program of laboratory experiments on field cores of first-year sea ice has been conducted to aid in the development of constitutive ice models. A thorough assessment of the bulk physical properties and microstructural characteristics of the ice has been carried out in conjunction with a detailed set of cyclic loading and creep experiments. Methodology was developed to calculate an orientation factor that determines the average shear stress resolved on the basal planes, given the background normal stress. Examination of the constitutive behavior using laboratory cyclic loading and constant load creep experiments revealed that the elastic, anelastic (time-dependent recoverable), and viscous strains varied systematically with the orientation factor. The observations also indicate significant brine porosity effects on the elastic, anelastic and viscous components of strain. A recently developed constitutive model was expanded to include a frequency- and orientation-dependent viscous straining term, and the model predictions agreed well with the experimental observation.

53-552

**Ductile compressive failure of columnar saline ice under triaxial loading.**

Melton, J.S., Schulson, E.M., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,759-21,766, 21 refs.

Sea ice, Ice mechanics, Ice strength, Loads (forces), Ice solid interface, Compressive properties, Ice crystal structure, Orientation, Stress strain diagrams, Stress concentration, Indexes (ratios)

53-553

**Nucleation of feather cracks in columnar freshwater ice: experimental observations.**

Gupta, V., Picu, R.C., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,767-21,774, 25 refs.

River ice, Ice mechanics, Ice microstructure, Crack propagation, Nucleation, Sliding, Loads (forces), Ice deformation, Ice solid interface, Strain tests, Shear stress, Mechanical properties

53-554

**Edge wave observation using remote seismoacoustic sensing of ice events in the Arctic.**

Dudko, I.U.V., Schmidt, H., Von der Heydt, K., Scheer, E.K., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,775-21,781, 11 refs.

Oceanography, Sea ice, Ice mechanics, Ice acoustics, Ice openings, Ice edge, Elastic waves, Wave propagation, Low frequencies, Underwater acoustics, Seismic surveys, Wave propagation, Mathematical models, Arctic Ocean

53-555

**Inversion of pack ice elastic wave data to obtain ice physical properties.**

Stein, P.J., Euerle, S.E., Parinella, J.C., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,783-21,793, 23 refs.

Sea ice, Pack ice, Ice mechanics, Mechanical properties, Ice acoustics, Elastic waves, Wave propagation, Low frequencies, Velocity measurement, Statistical analysis, Correlation, Arctic Ocean

53-556

**Fracture of multiyear sea ice.**

Sammonds, P.R., Murrell, S.A.F., Rist, M.A., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,795-21,815, 65 refs.

Sea ice, Ice mechanics, Mechanical properties, Tensile properties, Cracking (fracturing), Ice deformation, Shear stress, Stress concentration, Nucleation, Thin sections, Stress strain diagrams, Strain tests, Temperature effects

53-557

**Characteristics of pack ice stress in the Alaskan Beaufort Sea.**

Richter-Menge, J.A., Elder, B.C., MP 5235, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,817-21,829, 36 refs.

Sea ice, Pack ice, Ice mechanics, Stress concentration, Thermal stresses, Tensile properties, Ice temperature, Temperature effects, Mechanical tests, Sensors, Statistical analysis, Correlation, Beaufort Sea

Ice stresses in a multiyear floe were continuously monitored over 6 months in the fall-winter-spring of 1993-94. Stress sensors were installed at sites near the edge and at the center of the floe, which was located in the pack ice of the Alaskan Beaufort Sea. Compressive stresses in the major principal stress component varied significantly among the measurement sites, being of greater magnitude and exhibiting more high-frequency variations at the edge than at the center of the floe. Maximum compressive stresses, measured at a site 400 m from the edge of the floe, ranged from 100 to 300 kPa. Tensile stresses and the minor principal stress component were relatively constant at all measurement sites. A cross-correlation analysis indicates that the minor principal stress is strongly correlated to changes in the ice temperature. This result suggests that the minor principal stress component provides a good first-order approximation of thermally induced stresses. Ice-motion-induced stresses, distinguished by variations in magnitude of the order of hours, also have a significant low-frequency content similar to the thermal stresses. These low-frequency changes occur over a period of days. Seasonal variations in the characteristics of the stress were also evident and are likely to reflect the developing continuity of the pack as the winter season progresses.

53-558

**Motion-induced stresses in pack ice.**

Lewis, J.K., Richter-Menge, J.A., MP 5236, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,831-21,843, 23 refs.

Sea ice, Pack ice, Ice mechanics, Shear stress, Stress concentration, Tensile properties, Ice deformation, Air ice water interaction, Mathematical models, Simulation, Beaufort Sea

The authors consider motion-induced stresses in pack ice through the analyses of a variety of observations collected during the Sea Ice Mechanics Initiative study conducted in the Beaufort Sea during 1993. Motion-induced components of *in situ* stress from stress gauge data are compared to stresses calculated as residuals based on

a force balance argument using observed wind, current and ice motion data. There are three significant stress events determined by the force balance calculations, but only the one event in the north-south direction has a strong corresponding signal in the stress gauge data. The results suggest that to effectively develop an understanding of the role that point stress measurements can play in developing the understanding of the process of ice deformation, it may be necessary to couple the stress measurements with models of the patterns of motion-induced stresses within a floe.

### 53-559

#### Arctic sea ice as a granular plastic.

Overland, J.E., McNutt, S.L., Salo, S., Groves, J., Li, S.S., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,845-21,867, 40 refs.

Sea ice distribution, Ice mechanics, Plastic properties, Ice floes, Aggregates, Drift, Advection, Air ice water interaction, Synthetic aperture radar, Drift stations, Correlation, Wind factors, Beaufort Sea

### 53-560

#### Thermomechanics of pack ice.

Lewis, J.K., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,869-21,882, 38 refs.

Sea ice, Pack ice, Ice mechanics, Thermodynamic properties, Thermal stresses, Tensile properties, Cracking (fracturing), Porosity, Rheology, Mathematical models, Snow cover effect

### 53-561

#### Four stages of pressure ridging.

Hopkins, M.A., MP 5237, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,883-21,891, 17 refs.

Sea ice, Ice cover strength, Ice cover thickness, Ice mechanics, Pressure ridges, Ice pileup, Classifications, Drift, Ice solid interface, Elastic properties, Computerized simulation

The pressure ridging process is simulated using a two-dimensional particle model. Blocks are broken from an intact sheet of relatively thin lead ice pushed against a thick, multiyear floe at a constant speed. The blocks of ice rubble accumulate to form the ridge sail and keel. During the simulations the energy consumed in ridge growth, including dissipation, is explicitly calculated. On the basis of the results of simulations performed with the model, the ridging process can be divided into four distinct stages. The results of simulations establish the dependence of ridging energetics on the thickness of the ice sheet and the amount of ice pushed into the ridge. The average profiles of the simulated ridges delineate the growth process in the first, second and third stages. Lead ice extents of up to 1300 m are pushed into ridges to determine maximum sail heights, keel drafts and ridging forces.

### 53-562

#### Large-scale sea ice drift and deformation: comparison between models and observations in the western Weddell Sea during 1992.

Geiger, C.A., Hibler, W.D., III, Ackley, S.F., MP 5238, *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,893-21,913, 22 refs.

Oceanography, Ice mechanics, Mechanical properties, Shear properties, Sea ice distribution, Drift, Ice deformation, Velocity measurement, Drift stations, Mathematical models, Statistical analysis, Rheology, Correlation, Antarctica—Weddell Sea

Statistical comparison between numerical sea ice models and an observed large-scale strain array in the western Weddell Sea during 1992 are used to evaluate the performance of three of the more generally utilized sea ice rheology formulations. Results show that sea ice velocity is reproduced with relatively high accuracy in models having high-quality atmospheric forcing fields. Inclusion of both compressive and shear stresses is important in attaining a proper probability distribution of deformation relative to observations. Additional analysis shows that adjustments to specific model parameters improve the model results for either drift or select deformation components, but no best solution could be found, given the models examined here. Results suggest that inclusion of more physically based processes, such as subtidal and inertial oscillations, reconsideration of the boundary layer formulation, and consideration of anisotropy, may be necessary to include in next-generation sea ice models, especially those that are intended for coupling with high-resolution (eddy resolving) ocean models.

### 53-563

#### Architecture of an anisotropic elastic-plastic sea ice mechanics constitutive law.

Coon, M.D., Knoke, G.S., Echert, D.C., Pritchard, R.S., *Journal of geophysical research*, Sep. 15, 1998, 103(C10), p.21,915-21,925, 23 refs.

Sea ice, Pack ice, Ice mechanics, Shear strength, Ice openings, Surface structure, Anisotropy, Orientation, Stress concentration, Plastic flow, Tensile properties, Ice water interface, Anisotropy, Mathematical models

### 53-564

#### Chemical, physical and mineralogical analysis of soil and marine sediments from King George Island, South Shetland Archipelago, Antarctica.

Schuch, L.A., et al, *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.9-17, With Spanish summary. 11 refs.

Soil analysis, Soil chemistry, Frozen ground physics, Mineralogy, Marine deposits, Sediments, Antarctica—King George Island

### 53-565

#### Geomorphology of Coppermine Peninsula, Robert Island, South Shetland Islands, Antarctica. [Geomorfología de la península Coppermine, isla Robert, Islas Shetland del Sur, Antártica]

Serrano, E., López-Martínez, J., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.19-29, In Spanish with English summary. 13 refs.

Geomorphology, Mapping, Terrain identification, Glacial deposits, Periglacial processes, Antarctica—Coppermine Peninsula

### 53-566

#### Post-eclosion homeothermy development in chicks of two antarctic bird species: *Pygoscelis papua* and *Daption capense* in Ardley Peninsula, King George Island. [Desarrollo posteclosionario de la homeotermia en polluelos de dos especies de aves antárticas: *Pygoscelis papua* y *Daption capense* en península Ardley, isla Rey Jorge]

Soto-Gamboa, M., Nespolo, R.F., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.31-37, In Spanish with English summary. 15 refs.

Low temperature research, Animals, Physiological effects, Acclimatization, Antarctica—Ardley Island

### 53-567

#### Survey of mesocyclones near the Antarctic Peninsula using digital satellite imagery collected at Palmer Station.

Carrasco, J.F., Bromwich, D.H., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.39-57, With Spanish summary. Refs. p.55-57.

Oceanographic surveys, Atmospheric disturbances, Air ice water interaction, Sea ice, Advection, Image processing, Synoptic meteorology, Antarctica—Palmer Station

### 53-568

#### Morphology and systematics of Early Cretaceous flora from President Head, Snow Island, South Shetland Islands, Antarctica. [Morfología y sistemática de la flora del Cretácico Inferior de President Head, Isla Snow, archipiélago de las Shetland del Sur, Antártica]

Torres, T., Barale, G., Thévenard, F., Philippe, M., Galleguillos, H., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.59-86, In Spanish with English summary. Refs. p.83-86.

Paleobotany, Paleocology, Biogeography, Paleoclimatology, Glacial geology, Antarctica—President Head

### 53-569

#### Entanglement of antarctic fur seals, *Arctocephalus gazella*, by marine debris at Cape Shirreff and San Telmo Islets, Livingston Island, Antarctica: 1988-1997.

Hucke-Gaete, R., Torres N., D., Vallejos M., V., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.123-135, With Spanish summary. Refs. p.132-133.

Water pollution, Ships, Waste disposal, Environmental protection, Animals, Antarctica—Livingston Island

### 53-570

#### Beach debris survey at Cape Shirreff, Livingston Island, during the antarctic season 1996/97.

Torres, D., Jorquera, D., Vallejos, V., Hucke-Gaete, R., Zárate, S., *Santiago de Chile. Instituto Antártico Chileno. Serie científica*, 1997, No.47, p.137-147, With Spanish summary. 7 refs.

Beaches, Impurities, Plastics, Water pollution, Ships, Waste disposal, Environmental protection, Animals, Antarctica—Shirreff, Cape

### 53-571

#### Survival of two snow patches in the UK until winter 1997/98.

Watson, A., Pottier, J., Duncan, D., *Weather*, May 1998, 53(5), p.155-158, 3 refs.

Weather observations, Precipitation (meteorology), Snow cover, Snowdrifts, Survival, Snow air interface, Snowmelt, Wind factors, Seasonal variations, United Kingdom—Scotland

### 53-572

#### Soils of high-mountain tundras of south-east Altai.

Goncharova, O.I.U., Vladychenski, A.S., Volkov, A.V., *Moscow University. Soil science bulletin*, 1998, 52(2), p.7-12, Translated from Vestnik Moskovskogo Universiteta. Pochvovedenie. 34 refs.

Mountain soils, Tundra soils, Steppes, Organic soils, Soil aggregates, Profiles, Chemical properties, Sampling, Russia—Siberia

### 53-573

#### Proto-basement in Svalbard.

Harland, W.B., *Polar research*, Dec. 1997, 16(2), p.123-147, Refs. p.143-147.

Pleistocene, Tectonics, Earth crust, Subpolar regions, Stratigraphy, Lithology, Geochemistry, Classifications, Geological surveys, Geological maps, Geochronology, Norway—Svalbard

### 53-574

#### On the coexistence of cubic and hexagonal ice between 160 and 240 K.

Johari, G.P., *Philosophical magazine*, Oct. 1998, 78(4), p.375-383, 29 refs.

Ice physics, Cubic ice, Thermodynamics, Phase transformations, Ice crystal growth, Ice crystal size, Ice solid interface, Ice vapor interface, Mathematical models, Temperature effects, Theories

### 53-575

#### Anomalous isostructural transformation in ice VIII.

Tse, J.S., Klug, D.D., *Physical review letters*, Sep. 21, 1998, 81(12), p.2466-2469, 22 refs.

Ice physics, High pressure ice, Phase transformations, Ice crystal structure, Water structure, Molecular structure, Thermodynamics, Molecular energy levels, Hydrogen bonds, Theories, Ice relaxation

### 53-576

#### Multisite disordered structure of ice VII to 20 GPa.

Nelmes, R.J., Loveday, J.S., Marshall, W.G., Hamel, G., Besson, J.M., Klotz, S., *Physical review letters*, Sep. 20, 1998, 81(13), p.2719-2722, 22 refs.

Ice physics, High pressure ice, Deuterium oxide ice, Ice structure, Molecular structure, Orientation, Hydrogen bonds, Neutron diffraction, Temperature effects

### 53-577

#### Climate variations and changes in mass of three glaciers in western North America.

Hodge, S.M., Trabant, D.C., Krimmel, R.M., Heinrichs, T.A., March, R.S., Josberger, E.G., *Journal of climate*, Sep. 1998, 11(9), p.2161-2179, 58 refs.

Climatology, Climatic changes, Indexes (ratios), Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Atmospheric circulation, Statistical analysis, Correlation, Seasonal variations, United States—Alaska—Wolverine Glacier, United States—Alaska—Gulkana Glacier, United States—Washington—South Cascade Glacier

53-578

**Accurate parameterization of the infrared radiative properties of cirrus clouds for climate models.** Fu, Q., Yang, P., Sun, W.B., *Journal of climate*, Sep. 1998, 11(9), p.2223-2237, 39 refs. Climatology, Cloud cover, Cloud physics, Radiation balance, Ice crystal optics, Ice crystal size, Infrared radiation, Radiation absorption, Light scattering, Mathematical models

53-579

**River flow response to precipitation and snow budget in California during the 1994/95 winter.** Kim, J.W., Miller, N.L., Guetter, A.K., Georgakakos, K.P., *Journal of climate*, Sep. 1998, 11(9), p.2376-2386, 38 refs. Climatology, Precipitation (meteorology), Watersheds, Stream flow, Snow hydrology, Snowmelt, Snow accumulation, Water storage, Runoff forecasting, Mathematical models, Altitude, United States—California—Sierra Nevada

53-580

**Use of a multifactor Southern Oscillation index for the estimation of annual hailstorm frequencies in the Sydney area.** Kuhnelt, I., *International journal of climatology*, June 30, 1998, 18(8), p.841-858, 50 refs. Climatology, Weather forecasting, Storms, Hail, Classifications, Hailstone structure, Indexes (ratios), Seasonal variations, Statistical analysis, Atmospheric circulation, Safety, Australia—Sydney

53-581

**Evaluation of the efficiency of controlling engineering-geological processes from the results of geocryological prognoses (illustrated by the example of the Baikal-Amur trunk line).** Garagulia, L.S., Ospennikov, E.N., Shatalova, T.I.U., *Moscow University geology bulletin*, 1996, 51(6), p.48-60, Translated from *Vestnik Moskovskogo Universiteta. Geologiya*. 7 refs. Engineering geology, Geocryology, Permafrost hydrology, Subpermafrost ground water, Thermokarst lakes, Drainage, Freeze thaw cycles, Railroads, Subgrades, Embankments, Soil stabilization, Russia

53-582

**Deformation across the rupture zone of the 1964 Alaska earthquake, 1993-1997.** Savage, J.C., Svarc, J.L., Prescott, W.H., Gross, W.K., *Journal of geophysical research*, Sep. 10, 1998, 103(B9), p.21,275-21,283, 18 refs. Tectonics, Earthquakes, Fracture zones, Deformation, Stress concentration, Geodetic surveys, Seismic velocity, Models, United States—Alaska—Prince William Sound

53-583

**Antarctica and the international environmental protection. [L'Antarctique et la protection internationale de l'environnement]** Pannatier, S., *Etudes suisses de droit international*, Jan. 1994, Vol.88, 323p., In French. Refs. p.305-323. DLC KWX705.P36 1994 Environmental protection, Environmental impact, Legislation, International cooperation, Antarctica

53-584

**Antarctica and its mineral resources: the new legal framework. [L'Antarctique et ses ressources minérales: le nouveau cadre juridique]** Bermejo, R., Publications de l'Institut Universitaire de Hautes Etudes Internationales. Geneve, Paris, France, Presses Universitaires de France, 1990, 205p., In French. Refs. p.186-204. DLC JX4084.A5B47 1990 Mining, Legislation, Minerals, Natural resources, International cooperation, Antarctica

53-585

**Draft Antarctica Protection Act.** Rinzeima, J., *Environmental policy and law*, May 1996, 26(2-3), p.95-103, Refs. p.101-103. DLC Law Per 1996 Environmental protection, Legislation, International cooperation, Antarctica

53-586

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Paleoclimatology, Pleistocene, Paleocology, Marine deposits, Oxygen isotopes, Isotope analysis, Geochemical cycles, Stratigraphy, Russia, Norway—Spitsbergen

## 53-654

**Rheology of developed and undeveloped wheat flour dough.**

Campos, D.T., East Lansing, Michigan State University, 1996, 173p., University Microfilms order No.AAD97-18810, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58B(1), 1996, p.8.

Rheology, Hydrates, Ice mechanics, Porous materials, Ice crystals, Ice solid interface, Shear properties, Viscoelasticity, Mechanical tests, Dynamic loads

## 53-655

**Asynchronously coupled continental ice sheet/energy balance/climate model.**

Steen, R.S., Houston, Rice University, 1996, 83p., University Microfilms order No.AAD13-82747, MS. thesis. For abstract see Masters abstracts international, 35(3), 1996, p.828.

Paleoclimatology, Pleistocene, Land ice, Radiation balance, Ice sheets, Glacier oscillation, Periodic variations, Ice air interface, Computerized simulation, Correlation

## 53-656

**Preliminary investigation of WSR-88D data for winter hydrometeorological events in upstate New York.**

Houck, R.E., Stony Brook, State University of New York, 1996, 173p., University Microfilms order No.AAD13-82769, MS. thesis. For abstract see Masters abstracts international, 35(3), 1996, p.777. For another version see 50-3109.

Precipitation (meteorology), Snowstorms, Remote sensing, Radar echoes, Snow water equivalent, Lake effects, Statistical analysis, Image processing, Classifications, United States—New York

## 53-657

**On the estimation of ice crystal mass.**

Cai, Q.M., Reno, University of Nevada, 1996, 89p., University Microfilms order No.AA13-82819, MS. thesis. For abstract see Masters abstracts international, 35(3), 1996, p.828.

Climatology, Weather modification, Precipitation (meteorology), Cloud seeding, Cloud physics, Ice crystal growth, Snow crystal structure, Heterogeneous nucleation, Forecasting

## 53-658

**Laboratory study on the phase transition for polar stratospheric cloud particles.**

Teets, E.H., Jr., Reno, University of Nevada, 1996, 91p., University Microfilms order No.AAD13-82820, MS. thesis. For abstract see Masters abstracts international, 35(3), 1996, p.828.

Climatology, Cloud physics, Polar stratospheric clouds, Aerosols, Phase transformations, Ice water interface, Ice crystal growth, Heterogeneous nucleation, Supercooling, Simulation

## 53-659

**Assessing the use of diatom assemblages as paleoenvironmental proxies in the Slave and Bear geological provinces, Northwest Territories, Canada.**

Ruland, K.M., Kingston, Ontario, Queen's University at Kingston, 1996, 158p., University Microfilms order No.AADMM-15195, MS. thesis. For abstract see Masters abstracts international, 35(3), 1996, p.756.

Paleoclimatology, Paleocology, Limnology, Lacustrine deposits, Hydrogeochemistry, Bacteria, Distribution, Classifications, Sampling, Statistical analysis, Canada—Northwest Territories

## 53-660

**Freeze/thaw conditioning of water treatment residuals.**

Parker, P.J., Potsdam, NY, Clarkson University, 1999, 214p., University Microfilms order No.AAD98-35632, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(5), 1998, p.2365.

Water treatment, Waste treatment, Sludges, Freeze thaw cycles, Ice water interface, Particles, Freezing rate, Water content, Models, Cost analysis

## 53-661

**Nitrogenous nutrition of phytoplankton from the northeastern subarctic Pacific Ocean.**

Varela, D.E., Vancouver, University of British Columbia, 1998, 198p., University Microfilms order No.AADNQ-27264, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(5), 1998, p.2064.

Marine biology, Plankton, Ecosystems, Water chemistry, Biomass, Nutrient cycle, Sampling, Pacific Ocean

## 53-662

**Mechanisms controlling long-term changes in periphytic diatom community structure.**

Olson, O.G., Bethlehem, PA, Lehigh University, 1998, 112p., University Microfilms order No.AAD98-33171, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(5), 1998, p.1981.

Ecosystems, Glacial hydrology, Glacial lakes, Microbiology, Biomass, Hydrogeochemistry, Nutrient cycle, Light effects, Simulation, United States—Alaska—Glacier Bay National Park

## 53-663

**Tree ring and glacial records of Holocene climate change, northern Gulf of Alaska region.**

Barclay, D.J., Albany, State University of New York, 1998, 232p., University Microfilms order No.AAD98-33580, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(5), 1998, p.2078.

Paleoclimatology, Glacial geology, Glacier oscillation, Calving, Moraines, Paleocology, Age determination, Geochronology, United States—Alaska—Alaska, Gulf

## 53-664

**Ice accretion on swept wings at glaze ice conditions.**

Vargas, M., Cleveland, Case Western Reserve University, 1998, 372p., University Microfilms order No.AAD98-33923, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(5), 1998, p.2300.

Aircraft icing, Ice accretion, Glaze, Surface roughness, Ice solid interface, Turbulent flow, Mechanical tests, Simulation

## 53-665

**Sedimentology and paleogeography of Glacial Lake Champagne, southern Yukon Territory.**

Barnes, S.D., Ottawa, Carleton University, 1997, 109p., University Microfilms order No.AADMQ-26901, MS. thesis. For abstract see Masters abstracts international, 36(5), 1998, p.1314.

Pleistocene, Geomorphology, Ice sheets, Lacustrine deposits, Glacial geology, Glacial lakes, Meltwater, Sedimentation, Stratigraphy, Geochronology, Canada—Yukon Territory—Champagne, Lake

## 53-666

**Prediction of rainfall and snowmelt-produced runoff: linking a hydrologic model with remote sensing and GIS.**

Levick, L.R., Tucson, University of Arizona, 1998, 213p., University Microfilms order No.AAD13-89289, MS. thesis. For abstract see Masters abstracts international, 36(5), 1998, p.1313.

Watersheds, Runoff forecasting, Remote sensing, Snow hydrology, Snowmelt, Rain, Stream flow, Geophysical surveys, Water erosion, Mathematical models, Statistical analysis, Seasonal variations

53-667

**Controls on CH<sub>4</sub> emissions from boreal and arctic wetlands.**

Moosavi, S.C., Durham, University of New Hampshire, 1998, 252p., University Microfilms order No.AAD98-31960, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1543.

Climatology, Atmospheric composition, Hydrogeochemistry, Wetlands, Arctic landscapes, Soil air interface, Water table, Vapor transfer, Natural gas, Sampling

53-668

**Termination of the last ice age in the mid-latitudes of South America.**

Moreno, P.I., Farmington, University of Maine, 1998, 187p., University Microfilms order No.AAD98-32046, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1561.

Pleistocene, Paleoclimatology, Climatic changes, Paleocology, Glacial geology, Glacier oscillation, Palynology, Stratigraphy, Statistical analysis, Chile

53-669

**One-dimensional mixed-layer ocean model for use in three-dimensional climate simulations.**

Stephens, M.Y., Providence, RI, Brown University, 1998, 196p., University Microfilms order No.AAD98-30538, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1689.

Climatology, Global change, Marine atmospheres, Convection, Heat flux, Surface temperature, Air ice water interaction, Ice growth, Ice cover effect, Simulation, Mathematical models

53-670

**Seismic-stratigraphic analysis of shelf-margin delta/slope fan and basin floor fan on high-latitude and middle-latitude margins.**

Bart, P.J., Houston, Rice University, 1998, 184p., University Microfilms order No.AAD98-30101, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1548.

Paleoclimatology, Marine geology, Marine deposits, Ice shelves, Geomorphology, Glacial hydrology, Deltas, Sea level, Sedimentation, Stratigraphy, Seismic surveys, Antarctica—Weddell Sea

53-671

**Fine-grained sediment and radionuclide adsorption in the Ob Gulf, Yenisey River, and Kara Sea, Russia.**

Colmer, M.R., College Station, Texas A&M University, 1998, 225p., University Microfilms order No.AAD98-30889, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1549.

Radioactive wastes, Leaching, Adsorption, Sea water, Estuaries, Sediments, Air pollution, Water pollution, Environmental impact, Environmental tests, Russia—Kara Sea, Russia—Yenisey River

53-672

**Paleoclimatic study of the midwestern United States from the stable isotope records in lake sediments.**

Lovan, N.A., Kalamazoo, Western Michigan University, 1998, 263p., University Microfilms order No.AAD98-28811, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1546.

Paleoclimatology, Climatic changes, Lacustrine deposits, Carbon isotopes, Isotope analysis, Radioactive age determination, Statistical analysis, United States—Ohio—Ladd Lake, United States—Wisconsin—Winnebago, Lake

53-673

**Icelandic peatlands: effects of draining on trace gas release.**

Oskarsson, H., Athens, University of Georgia, 1998, 139p., University Microfilms order No.AAD98-28395, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1464. Soil chemistry, Subpolar regions, Soil air interface, Peat, Hydrogeochemistry, Soil water, Water table, Drainage, Decomposition, Natural gas, Vapor transfer, Environmental impact, Iceland

53-674

**Development and preservation of tabular massive ground ice in permafrost regions.**

Moorman, B.J., Ottawa, Carleton University, 1998, 308p., University Microfilms order No.AAD98-26882, Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59B(4), 1998, p.1558. Geocryology, Geophysical surveys, Permafrost preservation, Permafrost physics, Ground ice, Glacial geology, Frozen ground mechanics, Physical properties, Radar echoes, Ice dating, Canada—Northwest Territories—Bylot Island

53-675

**Military geology in war and peace.**

Underwood, J.R., Jr., ed, Guth, P.L., ed, Reviews in Engineering Geology, Vol.13, Geological Society of America, 1998, 245p., Refs. passim. For selected papers see 53-676 through 53-680. Geological surveys, Engineering geology, Site surveys, Military operation, Military engineering, Military research, Aircraft landing areas, History

53-676

**Military Geology Branch of the U.S. Geological Survey from 1945 to 1972.**

Terman, M.J., Reviews in Engineering Geology, Vol.13, Military geology in war and peace. Edited by J.R. Underwood, Jr., and P.L. Guth, Boulder, CO, Geological Society of America, 1998, p.75-81, 17 refs.

Geological surveys, Mapping, Engineering geology, Military operation, Military research, Research projects, Organizations, History, Cost analysis

53-677

**Remote sensing, terrain analysis, and military operations.**

Rinker, J.N., Reviews in Engineering Geology, Vol.13, Military geology in war and peace. Edited by J.R. Underwood, Jr., and P.L. Guth, Boulder, CO, Geological Society of America, 1998, p.145-150, 7 refs. Includes mention of Project Sanguine, 1969, in which the U.S. Army Cold Regions Research and Engineering Laboratory provided photointerpretation to the U.S. Navy, of a proposed site in northern Wisconsin and Michigan for a submarine communications link antenna. Aerial surveys, Site surveys, Terrain identification, Photointerpretation, Military operation

53-678

**Location of sites for airstrips in North Greenland.**

Krinsley, D.B., Reviews in Engineering Geology, Vol.13, Military geology in war and peace. Edited by J.R. Underwood, Jr., and P.L. Guth, Boulder, CO, Geological Society of America, 1998, p.189-204, 15 refs.

Aircraft landing areas, Site surveys, Permafrost depth, Frozen ground strength, Soil trafficability, Greenland

53-679

**Selected military geology programs in the Arctic, 1950-1970.**

DeGoes, L., Neal, J.T., Reviews in Engineering Geology, Vol.13, Military geology in war and peace. Edited by J.R. Underwood, Jr., and P.L. Guth, Boulder, CO, Geological Society of America, 1998, p.205-210, 11 refs. Includes mention of studies on aircraft landing sites by the U.S. Army Cold Regions Research and Engineering Laboratory in the late 1950's and early 1960's.

Aircraft landing areas, Ice runways, Site surveys, Geological surveys, Engineering geology, Military engineering, Military research, Research projects, History

53-680

**Hydrogeological assessments of United Nations bases in Bosnia Hercegovina.**

Nathanail, C.P., Reviews in Engineering Geology, Vol.13, Military geology in war and peace. Edited by J.R. Underwood, Jr., and P.L. Guth, Boulder, CO, Geological Society of America, 1998, p.211-215, 4 refs.

Hydrogeology, Geological surveys, Site surveys, Engineering geology, Military engineering, Military operation, Wells, Ground water, Water supply, Bosnia

53-681

**Modelling of glacier melt and discharge.**

Hock, R.M., Zurich, Eidgenossische Technische Hochschule, 1998, n.p., Ph.D. thesis. For abstracts see Dissertation abstracts international, Vol.59C(3), 1998, p.599.

Glacial hydrology, Glacier melting, Meltwater, Glacier surfaces, Heat balance, Degree days, Seasonal variations, Models, Sweden

53-682

**Effects of enhanced ultraviolet-B radiation on subarctic ecosystems.**

Gehrke, C., Lund, Sweden, University, 1998, 110p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.59C(3), 1998, p.565.

Climatology, Plant ecology, Subarctic landscapes, Ecosystems, Biomass, Ozone, Solar radiation, Ultraviolet radiation, Damage, Simulation, Environmental tests

53-683

**Energy balance over an alpine snowcover: point measurements and areal distribution.**

Pluss, C.G., Zurich, Eidgenossische Technische Hochschule, 1996, 117p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58C(2), 1996, p.666.

Climatology, Climatic changes, Alpine landscapes, Surface energy, Heat balance, Snow cover distribution, Snow air interface, Meteorological factors, Topographic effects, Models, Switzerland—Alps

53-684

**Rock glacier dynamics: with reference to the glacier ice core model of formation.**

Palmer, C.F., Belfast, Queen's University of Belfast, 1996, 312p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58C(2), 1996, p.528.

Glacial geology, Rock glaciers, Structural analysis, Flow measurement, Permafrost physics, Ice cores, Ice composition, Sediment transport, Sounding, Iceland

53-685

**Arctic and oroarctic vegetation patterns in northern Europe as a consequence of topography, climate, bedrock conditions and grazing.**

Virtanen, R.J., Oulu, University, 1996, 165p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58C(2), 1996, p.465.

Plant ecology, Ecosystems, Subpolar regions, Vegetation patterns, Classifications, Climatic factors, Topographic effects, Bedrock, Animals, Damage, Norway—Spitsbergen, Finland

53-686

**Palaeoclimate and palaeoceanography of the Skagerrak-Kattegat since the Late Weichselian based on diatom records.**

Jiang, H., Lund, Sweden, University, 1996, 23p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58C(2), 1996, p.521.

Paleoclimatology, Oceanography, Subpolar regions, Marine deposits, Paleocology, Hydrography, Ocean currents, Drill core analysis, Correlation, Baltic Sea

53-687

Photosynthetic responses to frost and excessive light in field-grown Scots pine and Norway Spruce.

Lundmark, T., Uppsala, Sveriges Lantbruksuniversitet, 1996, 44p., Ph.D. thesis. For abstract see Dissertation abstracts international, Vol.58C(2), 1996, p.437.

Arctic landscapes, Forestry, Trees (plants), Frost action, Freezing points, Photosynthesis, Light effects, Damage, Temperature effects, Cold weather survival, Revegetation, Sweden

53-688

Timeless valleys of the antarctic desert.

Parfit, M., *National geographic*, Oct. 1998, No.4, p.120-135.

Deserts, Valleys, Ecosystems, Microbiology, Life (durability), Arctic landscapes, Exploration, Geological surveys, Antarctica—Taylor Valley, Antarctica—Wright Valley, Antarctica—Victoria Valley

53-689

Citronen Fjord massive sulphide deposit, Peary Land, North Greenland: discovery, stratigraphy, mineralization and structural setting.

Van der Stijl, F.W., Mosher, G.Z., *Geology of Greenland Survey Bulletin*, 1998, No.179, 40p., 56 refs.

Geological surveys, Subpolar regions, Natural resources, Minerals, Metals, Tectonics, Sediments, Exploration, Stratigraphy, Geological maps, Greenland

53-690

*Peridinium euryceps* sp. nov. (Peridinales, Dinophyceae), a cryophilic dinoflagellate from Lake Erken, Sweden.

Rengefors, K., Meyer, B., *Phycologia*, July 1998, 37(4), p.284-291, 39 refs.

Limnology, Ecosystems, Plant ecology, Plankton, Classifications, Ice bottom surface, Structural analysis, Scanning electron microscopy, Cold weather survival, Sweden—Erken, Lake

53-691

Morphology of *Chrysomulina leadbeateri* (Prymnesiophyceae) from northern Norway.

Eikrem, W., Thronsen, J., *Phycologia*, July 1998, 37(4), p.292-299, 16 refs.

Marine biology, Ecology, Subpolar regions, Algae, Sampling, Classifications, Scanning electron microscopy, Structural analysis, Norway—Vestfjorden

53-692

Mesospheric wind observations derived from Super Dual Auroral Radar Network (SuperDARN) HF radar meteor echoes at Halley, Antarctica: preliminary results.

Jenkins, B., Jarvis, M.J., Forbes, D.M., *Radio science*, July-Aug. 1998, 33(4), p.957-965, 16 refs. Climatology, Polar atmospheres, Atmospheric circulation, Wind direction, Gravity waves, Radar echoes, Ions, Backscattering, Diurnal variations, Spectra, Antarctica—Halley Station

53-693

Fluctuation in the number of needle sets and needle shed in *Pinus sylvestris*.

Jalkanen, R., *Scandinavian journal of forest research*, 1998, 13(3), p.284-291, 41 refs.

Plant physiology, Subpolar regions, Forest canopy, Forest lines, Growth, Decomposition, Plant tissues, Seasonal variations, Sampling, Statistical analysis, Revegetation, Finland—Rovaniemi

53-694

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Plant physiology, Subpolar regions, Forest lines, Trees (plants), Plant tissues, Growth, Age determination, Statistical analysis, Seasonal variations, Finland—Pakanajoki

53-695

Effect of ambient SO<sub>2</sub> levels on S fraction in *Pinus sylvestris* foliage growing in the subarctic. Manninen, S., Huttunen, S., Perämäki, P., *Scandinavian journal of forest research*, 1998, 13(3), p.306-316, 59 refs.

Plant physiology, Air pollution, Aerosols, Trees (plants), Subarctic landscapes, Plant tissues, Chemical composition, Damage, Chemical analysis, Environmental impact, Seasonal variations, Statistical analysis, Russia—Kola Peninsula

53-696

Modelling probability of snow and wind damage using tree, stand, and site characteristics from *Pinus sylvestris* sample plots.

Fridman, J., Valinger, E., *Scandinavian journal of forest research*, 1998, 13(3), p.348-356, 31 refs. Plant ecology, Forest ecosystems, Trees (plants), Cold weather survival, Subarctic landscapes, Snow loads, Wind factors, Damage, Classifications, Models, Statistical analysis, Forecasting, Sweden

53-697

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Oceanography, Climatology, Sea ice, Ocean currents, Heat balance, Convection, Ice growth, Air ice water interaction, Ice cover effect, Ice models, Mathematical models, Thermodynamics

53-698

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Cloud cover, Polar atmospheres, Atmospheric physics, Air flow, Temperature inversions, Wind velocity, Photography, Sounding, Profiles, Canada—Northwest Territories—Baffin Island

53-699

Landsat interpretation of glaciotectionic terrain and lineaments in northern and southwestern Poland.

Aber, J.S., Ruszczyńska-Szenajch, H., Krzyszkowski, D., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.1-11, Refs. p.10-11.

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Glacial geology, Paleoclimatology, Tectonics, LANDSAT, Image processing, Mountains, Glaciation, Poland

53-700

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53-701

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Glacial geology, River flow, Climatic changes, Drainage, Poland

53-702

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53-703

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53-704

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53-705

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53-706

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53-707

Loess geochemistry and mineralogy in eastern Middle Belgium. [Géochimie et minéralogie du loess de Moyenne Belgique orientale]

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Glacial geology, Loess, Soil tests, Geochemistry, Mineralogy, Belgium

53-708

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53-709

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53-710

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Klimek, K., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.147-153, 20 refs.

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53-711

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53-712

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53-713

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53-714

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53-715

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53-716

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53-717

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DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Glacial deposits, Glacial hydrology, Glacier flow, Climatic changes, Soil classification

53-718

Weathering of heavy minerals in podzol soil profiles on aeolian sands in Central Poland.

Manikowska, B., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.209-213, 14 refs.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Podsol, Weathering, Minerals, Eolian soils, Soil analysis, Sediments, Poland

53-719

Evolution of a marginal form and of kames in the region of Bielsk Podlaski. Sedimentological analysis of deposits.

Mycielska-Dowgiałło, E., Pękalska, A., Woronko, B., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.215-224, 17 refs.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Paleoclimatology, Geomorphology, Sediment transport, Glacial deposits, Glacier melting, Eolian soils, Poland

53-720

Diagnostic features of subglacial channels of glacial and glacio-glaciofluvial origin, exemplified by channels of the Chłmno-Dobrzyń and the eastern Gniezno Lakelands.

Niewiarowski, W., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.225-231, Refs. p.230-231.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Geomorphology, Glacial erosion, Landforms, Subglacial drainage, Channels (waterways), Glacial deposits, Climatic changes, Subglacial observations, Poland

53-721

Age of dunes in Poland—selected problems.

Nowaczyk, B., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.233-239, Refs. p.238-239.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Paleoclimatology, Climatic changes, Landforms, Eolian soils, Geochronology, Human factors, Poland

53-722

Two types of periglacial slopes of Upper Belgium. [Deux types de versants périglaciaires de Haute Belgique]

Pissart, A., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.241-245, In French with English summary. 7 refs.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Glacial deposits, Periglacial processes, Slope processes, Glaciers, Climatic changes, Belgium

53-723

Estonia—a land of big boulders and rafts.

Raukas, A., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.247-253, 23 refs.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Topographic surveys, Moraines, Rocks, Bedrock, Environmental protection, Glacial deposits, Glaciation, Estonia

53-724

Taxonomy of glacials and disharmony of glaciation.

Stankowski, W., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.255-258, 26 refs.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Paleoclimatology, Climatic changes, Glaciation, Ice age theory, Glacier oscillation

53-725

Pattern of the Holocene climatic variations in Central Europe based on various geological records.

Starkel, L., *Quaestiones Geographicae*, Oct. 1995, No.4 (Special issue), p.259-264, Refs. p.263-264.

DLC G1.Q3 No.4 1995 Special Issue

Glacial geology, Paleoclimatology, Climatic changes, Mountain glaciers, Glacier surges, Pleistocene, Climatic factors, Hydrogeology, Glacial hydrology, Europe

53-726

Arctic paleo-river discharge (APARD); a new research programme of the Arctic Ocean Science Board (AOSB).

Stein, R., ed, *Berichte zur Polarforschung*, 1998, No.279, 128p., Refs. passim.

Meetings, Sediments, River flow, Runoff, Suspended sediments, Sediment transport, Salinity, Ocean currents, Hydrologic cycle, Paleoclimatology, Global change, Arctic Ocean, Russia—Kolyma River, Russia—Indigirka River, Russia—Lena River, Russia—Kotuy River, Russia—Yenisey River, Russia—Ob' River, Russia—Pechora River, Russia—Dvina River, MacKenzie River

53-727

Three-dimensional natural convective flow about a melting horizontal ice cylinder.

Oosthuizen, P.H., Xu, Z., Proceedings of the ASME Heat Transfer Division, Volume 3. International Mechanical Engineering Congress and Exposition, November 16-21, 1997, Dallas, TX. Edited by M.E. Ulucakli, et al., New York, NY, American Society of Mechanical Engineers, 1997, p.277-282, 13 refs.

DLC TJ260.P76424 1997 Vol.3

Water flow, Convection, Ice melting, Ice water interface

53-728

Analysis of daily <sup>210</sup>Pb air concentrations in Finland, 1967-1996.

Paatero, J., Hatakka, J., Mattsson, R., Viisanen, Y., *Radiation protection dosimetry*, 1998, 77(3), p.191-198, 22 refs.

Climatology, Subpolar regions, Atmospheric composition, Radioactivity, Radioactive isotopes, Aerosols, Seasonal variations, Statistical analysis, Sampling, Environmental tests, Finland

53-729

Simultaneous thermoluminescence and optically stimulated luminescence dating of Late Pleistocene sediments from Lake Baikal.

Rogalev, B., Chernov, V., Korjonen, K., Jungner, H., *Radiation measurements*, July-Aug. 1998, 29(3-4), International Symposium on the Luminescent Detectors and Transformers of Ionizing Radiation, 3rd, Ustron, Poland, Oct. 6-10, 1997. Selected papers, p.441-444, 7 refs.

Pleistocene, Lacustrine deposits, Sedimentation, Drill core analysis, Luminescence, Lithology, Age determination, Correlation, Geochronology, Accuracy, Russia—Baykal, Lake

53-730

Radioactive contamination of the Baltic Sea in the region of the Leningrad nuclear power plant in 1971-1996.

Gedeonov, L.I., et al, *Radiochemistry*, July-Aug. 1998, 40(4), p.385-390, Translated from Radiokhimiia. 12 refs.

Oceanography, Nuclear power, Subpolar regions, Water pollution, Water transport, Radioactivity, Radioactive isotopes, Sampling, Environmental tests, Seasonal variations, Baltic Sea

53-731

Steady-state creep of an ice cover lying on a frozen soil under the action of a lumped force.

Aleksandrov, V.M., Shmatkova, A.A., *Mechanics of solids*, 1998, 33(1), p.38-42, Translated from Izvestiia AN. Mekhanika tverdogo tela. 5 refs.

Frozen ground mechanics, Ice cover, Ice solid interface, Ice creep, Ice deformation, Mathematical models

53-732

On the antarctic origin of low ozone events at the South American continent during the springs of 1993 and 1994.

Pérez, A., Jaque, F., *Atmospheric environment*, Nov. 1998, 32(21), p.3665-3668, 12 refs.

Climatology, Air pollution, Polar atmospheres, Stratosphere, Air masses, Ozone, Atmospheric circulation, Air flow, Spectroscopy, Seasonal variations, Antarctica, Argentina

53-733

**Causes of seasonal and daily variations in aerosol sea-salt concentrations at a coastal antarctic station.**

Hall, J.S., Wolff, E.W., *Atmospheric environment*, Nov. 1998, 32(21), p.3669-3677, 38 refs. Climatology, Polar atmospheres, Atmospheric composition, Marine atmospheres, Aerosols, Salinity, Brines, Ice air interface, Wind direction, Seasonal variations, Sampling, Antarctica—Halley Station

53-734

**Reliability of moss (*Hylocomium splendens* and *Pleurozium schreberi*) as a bioindicator of atmospheric chemistry in the Barents region: interspecies and field duplicate variability.**

Halleraker, J.H., et al, *Science of the total environment*, July 30, 1998, 218(2-3), p.123-139, 31 refs. Climatology, Subpolar regions, Air pollution, Metals, Environmental tests, Plant ecology, Geochemistry, Ecosystems, Mosses, Chemical composition, Sampling, Correlation, Russia

53-735

**Concentration and fractionation of heavy metals in roadside soils receiving de-icing salts.**

Norrström, A.C., Jacks, G., *Science of the total environment*, July 30, 1998, 218(2-3), p.161-174, 48 refs. Soil pollution, Water pollution, Road icing, Hydrogeochemistry, Salting, Metals, Colloids, Runoff, Leaching, Environmental impact, Environmental tests, Sampling, Sweden

53-736

**$^{14}\text{C}$  dating of Late Pleistocene-Holocene events on Kunashir Island, Kuril Islands.**

Bazarova, V.B., Razzhigaeva, N.G., Grebennikova, T.A., Ganzei, L.A., Mokhova, L.M., Korotkiĭ, A.M., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.775-780, 8 refs. Pleistocene, Paleoclimatology, Paleoeology, Vegetation patterns, Sediments, Quaternary deposits, Sampling, Radioactive age determination, Statistical analysis, Russia—Kuril Islands

53-737

**Minimal extension phases of Unteraarglacier (Swiss Alps) during the Holocene based on  $^{14}\text{C}$  analysis of wood.**

Hornes, A., Schlüchter, C., Stocker, T.F., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.809-817, 38 refs. Paleoclimatology, Climatic changes, Alpine glaciation, Glacier oscillation, Quaternary deposits, Paleoeology, Glacial deposits, Outwash, Radioactive age determination, Geochronology, Switzerland—Alps

53-738

**$^{14}\text{C}$  ages of tephra layers from the Holocene deposits of Kunashir Island (Russian far east).**

Razzhigaeva, N.G., et al, *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.841-847, 21 refs. Quaternary deposits, Paleoeology, Palynology, Volcanic ash, Carbon isotopes, Radioactive age determination, Stratigraphy, Correlation, Russia—Kunashir Island

53-739

**$^{14}\text{C}$  dating of terrestrial moss in Tern Lake deposits, Antarctica.**

Shen, C.D., et al, *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.849-854, 11 refs. Paleoeology, Arctic landscapes, Mosses, Lacustrine deposits, Carbon isotopes, Drill core analysis, Sedimentation, Radioactive age determination, Antarctica—King George Island

53-740

**$^{14}\text{C}$  AMS dating of Icelandic lake sediments.**

Sveinbjörnsdóttir, A.E., Heinemeier, J., Kristensen, P., Rud, N., Geirsdóttir, A., Hardardóttir, J., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.865-872, 13 refs.

Quaternary deposits, Lacustrine deposits, Subpolar regions, Sedimentation, Organic soils, Carbon isotopes, Radioactive age determination, Sampling, Iceland

53-741

**$^{14}\text{C}$  and  $^{18}\text{O}$  in Siberian syngenetic ice-wedge complexes.**

Vasil'chuk, I.U.K., Vasil'chuk, A.C., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.883-893, 21 refs.

Geocryology, Sediments, Ice dating, Permafrost dating, Ice wedges, Carbon isotopes, Oxygen isotopes, Ice dating, Profiles, Correlation, Russia—Siberia

53-742

**$^{14}\text{C}$  age of palsas in northern Eurasia.**

Vasil'chuk, I.U.K., Vasil'chuk, A.C., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.895-904, 27 refs.

Geocryology, Frost mounds, Geomorphology, Peat, Permafrost hydrology, Permafrost dating, Quaternary deposits, Carbon isotopes, Radioactive age determination, Freeze thaw cycles, Norway, Russia—Siberia, Canada—Northwest Territories—Cornwallis Island

53-743

**Reappraisal of Chinese Loess Plateau stratigraphy sequences over the last 30,000 years: precursors of an important Holocene monsoon climatic event.**

Zhou, W.J., An, Z.S., Jull, A.J.T., Donahue, D.J., Head, M.J., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.905-913, 21 refs.

Pleistocene, Paleoclimatology, Precipitation (meteorology), Quaternary deposits, Loess, Eolian soils, Radioactive age determination, Stratigraphy, Profiles, Correlation, China—Loess Plateau

53-744

**$^{14}\text{C}$  studies of natural ice.**

Wilson, A.T., *Radiocarbon*, 1998, 40(2), International Radiocarbon Conference, 16th, Tucson, AZ, June 16-20, 1997. Proceedings, Pt.2. Applications. Edited by W.G. Mook et al, p.953-962, 22 refs.

Ice physics, Ground ice, Ice dating, Ice cores, Ice sublimation, Paleoclimatology, Carbon dioxide, Carbon isotopes, Indexes (ratios), Radioactive age determination, Laboratory techniques

53-745

**Seasonal variation of phytoplankton community structure and nitrogen uptake regime in the Indian Sector of the Southern Ocean.**

Mengesha, S., Dehairs, F., Fiala, M., Elskens, M., Goeyens, L., *Polar biology*, Oct. 1998, 20(4), p.259-272, Refs. p.271-272.

Cryobiology, Sea ice, Ecology, Algae, Plant physiology, Sea water, Chemical analysis, Nutrient cycle

53-746

**Accumulation of organic and inorganic solutes in the subantarctic cruciferous species *Pringlea antiscorbutica* in response to saline and cold stresses.**

Hennion, F., Bouchereau, A., *Polar biology*, Oct. 1998, 20(4), p.281-291, Refs. p.290-291.

Plant physiology, Low temperature research, Plant ecology, Acclimatization, Cold tolerance, Kerguelen Islands, Crozet Islands

53-747

**Dielectric single cell spectra in snow algae.**

Müller, T., Schnelle, T., Fuhr, G., *Polar biology*, Nov. 1998, 20(5), p.303-310, 21 refs.

Cryobiology, Dielectric properties, Algae, Snow, Ecology, Plant physiology, Norway—Svalbard

53-748

**Diet and foraging effort of Adélie penguins in relation to pack-ice conditions in the southern Ross Sea.**

Ainley, D.G., Wilson, P.R., Barton, K.J., Ballard, G., Nur, N., Karl, B., *Polar biology*, Nov. 1998, 20(5), p.311-319, Refs. p.318-319.

Cryobiology, Polar regions, Marine biology, Fast ice, Ice cover effect, Antarctica—Ross Sea

53-749

**Snow algae of the Windmill Islands, continental Antarctica. 3. *Chloromonas polyptera* (Volvocales, Chlorophyta).**

Ling, H.U., Seppelt, R.D., *Polar biology*, Nov. 1998, 20(5), p.320-324, 15 refs.

Cryobiology, Polar regions, Ecology, Algae, Snow, Antarctica—Windmill Islands

53-750

**Longitudinal variation of zooplankton delta  $^{13}\text{C}$  through the Northwest Passage: inference for incorporation of sea-ice POM into pelagic food-webs.**

France, R., Loret, J., Mathews, R., Springer, J., *Polar biology*, Nov. 1998, 20(5), p.335-341, Refs. p.339-341.

Cryobiology, Plankton, Ecology, Marine biology, Sea ice, Nutrient cycle, Northwest passage

53-751

**Australian and Canadian initiatives in polar marine environmental protection: a comparative review.**

Rothwell, D.R., *Polar record*, Oct. 1998, 34(191), p.305-316, Refs. p.315-316.

Environmental protection, Ocean environments, Polar regions, Legislation, International cooperation, Australia, Canada

53-752

**Are vegetation indices useful in the Arctic.**

Rees, W.G., Golubeva, E.I., Williams, M., *Polar record*, Oct. 1998, 34(191), p.333-336, 15 refs.

Permafrost indicators, Vegetation patterns, Vegetation factors, Low temperature research, Image processing, LANDSAT, Biomass, Statistical analysis, Tundra vegetation

53-753

**Structural adaptations of the cold-active citrate synthase from an antarctic bacterium.**

Russell, R.J.M., Gerike, U., Danson, M.J., Hough, D.W., Taylor, G.L., *Structure*, Mar. 15, 1998, 6(3), p.351-361, 49 refs.

Bacteria, Acclimatization, Low temperature research, Physiological effects, Chemical analysis, Antarctica

53-754

**Summary report and proceedings.**

International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995, Krauss, T.W., ed, Carroll, T.R., ed, IGPO publication series, No.15, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, 294p. + append., Refs. passim. For selected papers see 53-755 through 53-787.

Snow hydrology, Snowfall, Snow cover distribution, Snowmelt, Seepage, Runoff forecasting, Hydrologic cycle, Water balance, Heat balance, Heat flux, Frozen ground thermodynamics, Atmospheric circulation, Global warming

53-755

**Meeting summary: International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology.**

Carroll, T.R., Krauss, T.W., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.3-15.

Glacial hydrology, Snow hydrology, Hydrologic cycle, Water balance, Climatic changes, Global warming, Meetings, Research projects, International cooperation, Data processing

53-756

**Suspended sediment and discharge regimes, Slims River, Yukon.**

Sawada, M.C., Johnson, P.G., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.19-23, 11 refs.

Snow hydrology, Snowmelt, Glacial hydrology, Meltwater, Alluvium, River flow, Suspended sediments, Sediment transport, Runoff forecasting, Canada—Yukon Territory—Kluane Lake

53-757

**Melting, drainage patterns and frozen lakes on the land mass at Jutulgryta in Dronning Maud Land, Antarctica.**

Winther, J.G., Sand, K., Bøggild, C.E., Elvehøy, H., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.24-26, 8 refs.

Frozen lakes, Lake ice, Ice melting, Subglacial drainage, Meltwater, Antarctica—Queen Maud Land

53-758

**Subglacial water flow conditions inferred from velocity-discharge relationships in glacial runoff.**

Nienow, P.W., Sharp, M., Willis, I.C., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.36-39, 3 refs.

Glacial hydrology, Subglacial drainage, Meltwater, Water flow, Switzerland

53-759

**Application of snow and evaporation models for predicting water fluxes at the arctic treeline in northwestern Canada.**

Marsh, P., Pomeroy, J., Quinton, W.L., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.47-50, 11 refs.

Snow hydrology, Snowmelt, Permafrost hydrology, Tundra climate, Forest lines, Evaporation, Water balance, Canada—Northwest Territories—Mackenzie Delta

53-760

**Subsurface runoff from tundra hillslopes in the continuous permafrost zone.**

Quinton, W.L., Marsh, P., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.51-55, 4 refs.

Tundra soils, Tundra terrain, Hummocks, Snowmelt, Seepage, Permafrost hydrology, Subpermafrost ground water, Subsurface drainage, Runoff, Canada—Northwest Territories—Mackenzie Delta

53-761

**Application of an arctic blowing snow model.**

Pomeroy, J.W., Marsh, P., Gray, D.M., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.56-60, 10 refs.

Blowing snow, Snowfall, Snowdrifts, Snow hydrology, Snow erosion, Wind erosion, Snow evaporation, Snowmelt, Snow water equivalent, Tundra terrain, Tundra climate, Runoff forecasting

53-762

**Snow interception at two sites of different altitude in Switzerland.**

Bründl, M., Schneebeli, M., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.61-65, 7 refs.

Forest canopy, Interception, Snow cover distribution, Snow hydrology, Snow evaporation, Snow water equivalent, Climatic changes, Switzerland

53-763

**Snowpack sublimation.**

Avery, C.C., Delinger, W.G., Dexter, L.R., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.73-75, 4 refs.

Snow air interface, Snow evaporation, Wind factors, Snow survey tools, Moisture meters, Water balance

53-764

**Modeling the effect of frozen ground on snowmelt/rainfall-runoff processes.**

Koren, V.I., Duan, Q.Y., Schaake, J.C., Jr., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.78-82, 7 refs.

Snow hydrology, Snowmelt, Seepage, Frozen ground thermodynamics, Frost penetration, Water balance, Runoff forecasting

53-765

**Preferential water flow in a frozen soil—a two-domain model approach.**

Stähli, M., Jansson, P.E., Lundin, L.C., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.83-86, 3 refs.

Snow hydrology, Snowmelt, Seepage, Frozen ground thermodynamics, Soil water migration

53-766

**Estimation of the changes in the available soil water storage over the winter.**

Shumova, N.A., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.88-92, 2 refs.

Snowmelt, Seepage, Soil water, Water storage, Water retention, Water balance, Runoff forecasting, Steppes

53-767

**Pathways of snowmelt water at the soil surface and in the soil.**

Stadler, D., Wunderli, H., Leuenberger, J., Flüeler, H., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.95-98, 6 refs.

Snow hydrology, Snowmelt, Seepage, Frost penetration, Frozen ground thermodynamics, Runoff forecasting

53-768

**On the role of aircraft in the study of regional evapotranspiration and energy exchange over northern ecosystems.**

Schuepp, P.H., Kaharabata, S., Abareshi, B., Pelletier, R., MacPherson, J.I., Desjardins, R.L., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.105-109, 11 refs.

Aerial surveys, Soil air interface, Evapotranspiration, Heat flux, Water balance

53-769

**Simulating the radiative energy balance associated with snow and frozen soils.**

Flerchinger, G.N., Baker, J.M., Spaans, E.J.A., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.110-113, 8 refs.

Snow air interface, Snow heat flux, Soil air interface, Frozen ground thermodynamics, Heat balance, Computerized simulation



## 53-770

**Estimation of lake evaporation by oxygen-18.**

Saxena, R.K., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.114-118, 5 refs.

Lake water, Water chemistry, Oxygen isotopes, Isotope analysis, Evaporation, Water balance

## 53-771

**Comments on the use of isotopic tracers in GCIP-LSA-NC and MAGS.**

Edwards, T.W.D., Gibson, J.J., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.120-123, 19 refs.

Precipitation (meteorology), Water chemistry, Isotope analysis, Water balance, Hydrologic cycle, Computerized simulation

## 53-772

**Radiosonde-based estimates of the boundary-layer budgets of sensible and latent heat above boreal forests.**

Barr, A.G., Betts, A.K., MacPherson, J.I., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.126-129, 4 refs.

Taiga, Forest canopy, Atmospheric boundary layer, Sounding, Heat flux, Heat balance

## 53-773

**Analysis and simulation of a winter storm in Idaho.**

Dawson, P., Johnson, G., Wang, D.H., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.131-135.

Snowstorms, Snowfall, Snow cover distribution, Snow hydrology, Weather forecasting, Long range forecasting, Computerized simulation, United States—Idaho

## 53-774

**Observations and modeling of precipitation systems in the Black Hills of South Dakota.**

Orville, H.D., Farley, R.D., Hjelmfelt, M.R., Rife, D.L., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.136-140, 15 refs.

Precipitation (meteorology), Snowfall, Snowstorms, Weather forecasting, Long range forecasting, Flood forecasting, Computerized simulation, United States—South Dakota—Black Hills

## 53-775

**Improved satellite estimates of cloud cover, radiative fluxes and areal extent of snow cover for use in hydrometeorology studies.**

Simpson, J.J., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.152-155, 9 refs.

Snow cover distribution, Snow cover effect, Cloud cover, Terrain identification, Heat flux, Radiometry, Spaceborne photography, Data processing, Image processing

## 53-776

**Mapping snow water equivalent and snow cover in North America.**

Carroll, T.R., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.173-176.

Snow surveys, Snow cover distribution, Snow water equivalent, Mapping, Spaceborne photography, Data processing

## 53-777

**New cryospheric data sets from the former Soviet Union.**

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Snow surveys, Snow depth, Snow cover distribution, Glacier surveys, Data processing, Russia

## 53-778

**Framework for orographic precipitation analysis.**

Schaafe, J.C., Peck, E.L., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.183-187.

Precipitation (meteorology), Snowfall, Snowstorms, Weather forecasting, Computerized simulation, Statistical analysis

## 53-779

**Water and energy fluxes during the snowmelt period at an arctic treeline site.**

Marsh, P., Pomeroy, J., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.197-201, 9 refs.

Snow hydrology, Snow heat flux, Snowmelt, Tundra climate, Forest lines, Heat balance, Runoff forecasting, Canada—Northwest Territories—Mackenzie Delta

## 53-780

**Snow cover simulation in the COLA atmospheric general circulation model: effects of model resolution and a comparison with observations.**

Kinter, J.L., III, International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.204-207, 5 refs.

Snow air interface, Snow cover distribution, Snow hydrology, Water balance, Hydrologic cycle, Runoff forecasting, Computerized simulation

## 53-781

**Cloud and snow cover effects on the surface-atmosphere interactions.**

Groisman, P.I.A., Zhai, P.M., Genikhovich, E.L., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.209-212, 17 refs.

Snow air interface, Snow cover effect, Snow heat flux, Cloud cover, Turbulent exchange, Heat balance, Computerized simulation

## 53-782

**Some aspects of the hydroclimatology of north-flowing high latitude rivers.**

Lawford, R.G., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.217-224, 4 refs.

Air water interactions, River flow, Sea water, Atmospheric circulation, Hydrologic cycle

## 53-783

**Snowmelt runoff modelling adaptations for work on large basins in cold regions.**

Rango, A., Brubaker, K., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.232-235, 5 refs.

Snow hydrology, Snowmelt, River basins, Runoff forecasting, Computerized simulation

## 53-784

**Spatially distributed hydrologic model for arctic regions.**

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Snow hydrology, Permafrost hydrology, Watersheds, Water balance, Computerized simulation

## 53-785

**Hydrological aspects of the major activities plan for GCIP.**

Hall, A.J., Schaafe, J.C., Jr., Coughlan, M.J., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.240-243, 2 refs.

Research projects, Atmospheric circulation, Hydrologic cycle, Water balance, Global warming, Computerized simulation



53-786

**Overview of GCIP activities.**

Leese, J.A., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.258-263, 5 refs.

Research projects, Global warming, Atmospheric circulation, Hydrologic cycle, Water balance, Heat balance, Data processing, Computerized simulation

53-787

**Discussion paper on GCIP studies in the LSA-NC.**

Lawford, R.G., International Global Energy and Water Cycle Experiment (GEWEX) Workshop on Cold-Season/Region Hydrometeorology, Banff, Alberta, May 22-26, 1995. Summary report and proceedings. IGPO publication series, No.15. Edited by T.W. Krauss and T.R. Carroll, Ottawa, Environment Canada, International GEWEX Project Office (IGPO), 1995, p.264-291, 21 refs.

Research projects, Global warming, Atmospheric circulation, Snowfall, Snow hydrology, Hydrologic cycle, Water balance, Heat balance, Data processing, Computerized simulation

53-788

**Daily temperature and precipitation data for 223 USSR stations.**

Razuvaev, V.N., Apasova, E.G., Martuganov, P.A., Vose, R.S., Steurer, P.M., Oak Ridge, TN, Oak Ridge National Laboratory, Carbon Dioxide Information Analysis Center, 1993, 47p. + appends., DE94-012496, With Russian summary and title page. 16 refs.

Weather stations, Meteorological data, Air temperature, Precipitation (meteorology), Air pollution, Russia

53-789

**Analysis of the tensile fracture of sea ice.**

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53-790

**Sensitivity of stationary wave amplitude to Laurentide ice sheet topography and the interpretation of the Heinrich event climate record.**

Jackson, C.S., Chicago, University, 1997, 160p., University Microfilms order No.98-23012, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 59(1), p.136.

Ice sheets, Topographic surveys, Ice surface, Ice air interface, Climatic factors, Atmospheric circulation, Ice volume, Glacier oscillation, Models, Paleoclimatology, Global warming

53-791

**3-dimensional structure and flow field of a temperate ice mass: surface and borehole deformation studies on Worthington Glacier, Alaska.**

Harper, J.T., Laramie, University of Wyoming, 1997, 137p., University Microfilms order No.98-21464, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 59(1), p.131.

Glacier surfaces, Ice deformation, Boreholes, Flow measurement, Velocity measurement, Crevasses, Strain tests, Structural analysis, Glacier flow, Glacier friction, United States—Alaska—Worthington Glacier

53-792

**Turboprop aircraft performance response to various environmental conditions.**

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Aircraft, Cold weather performance, Aircraft icing, Precipitation (meteorology), Supercooled clouds, Environmental tests, Cold weather tests, Engineering

53-793

**Seismic investigations of Rutford Ice Stream, West Antarctica.**

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53-794

**Heat and water transfer in the frozen soil environment.**

Stahli, M., Uppsala (Sweden), Sveriges Lantbruksuniversitet, 1997, 35p., Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.C 59(2), p.320.

Frozen ground thermodynamics, Heat transfer, Moisture transfer, Soil water migration, Hydraulics, Heat flux, Snow surface temperature, Snowmelt, Soil freezing, Soil temperature, Models

53-795

**Landscape development of the Transantarctic Mountains, Shackleton Glacier area, Antarctica: An integration of structural geology, geomorphology, and apatite fission-track thermochronology.**

Miller, S.R., Tucson, University of Arizona, 1997, 287p., University Microfilms order No.13-87971, M.S. thesis. For abstract see Masters abstracts international, 36(3), p.771.

Landscape development, Models, Glacial geology, Tectonics, Geomorphology, Structural analysis, Landscape types, Antarctica—Transantarctic Mountains, Antarctica—Shackleton Glacier

53-796

**Comparison of theory with laboratory and field observations of wave propagation in grease ice.**

Newyear, K.D., Seattle, University of Washington, 1997, 136p., University Microfilms order No.98-19281, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 58(12), p.6461.

Wave propagation, Sea ice, Rheology, Viscosity, Ice models, Experimentation, Viscous flow, Ice edge, Oceanographic surveys, Ice water interface, Ice cover effect, Ocean waves

53-797

**Silicon-isotope composition of diatoms as an indicator of past oceanic change.**

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Isotopes, Water chemistry, Sediments, Marine biology, Ice edge, Marine deposits, Bottom sediment, Nutrient cycle, Paleoclimatology, Antarctica—Ross Sea, South Atlantic Ocean

53-798

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53-799

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Ground water, Climatic changes, Oxygen isotopes, Mountain glaciers, Paleoclimatology, Switzerland

53-800

**Inflight icing: the handling event.**

Green, S., *Air line pilot*, Apr. 1998, 67(4), p.10-15. Aircraft icing, Stability, Ice accretion, Safety

53-801

**Ice that burns: can methane hydrates fuel the 21st century.**

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Subsea permafrost, Fuels, Hydrates, Natural gas, Canada—Northwest Territories—Mackenzie Delta, Mexico, Gulf, Japan

53-802

**How to pick anti-icing products. Better roads, June 1998, 68(6), p.18-19.**

Ice prevention, Ice removal, Chemical ice prevention, Road maintenance

53-803

**Indiana, Washington test anti-icer. Better roads, June 1998, 68(6), p.20.**

Tests, Chemical ice prevention, Road maintenance

53-804

**Snow and ice control strategies. Better roads, June 1998, 68(6), p.21.**

Snow removal, Ice removal, Equipment, Snow removal equipment, Road maintenance, United States—Oregon, United States—Washington

53-805

**Kola—the arctic nuclear power plant. Nuclear engineering international, July 1998, 43(528), p.28.**

Nuclear power, Construction, Specifications, Design, Safety, Subpolar regions, Russia—Kola Peninsula

53-806

**Kola Project Management Unit. Nuclear engineering international, July 1998, 43(528), p.29-30.**

Nuclear power, Subpolar regions, Safety, Organizations, Russia—Kola Peninsula

53-807

**Impact of solar cosmic rays on nitrates in the Greenland ice.**

Gladysheva, O.G., Dreschhoff, G.A.M., *Bulletin of the Russian Academy of Sciences. Physics*, 1997, 61(6), International Conference on Cosmic Rays, Moscow, Russia, June 24-26, 1996. Proceedings, p.833-836, Translated from Rossiiskaia akademiia nauk. Izvestia. Seriya fizicheskaya. 10 refs.

Ice physics, Ice sheets, Ice composition, Gamma irradiation, Geochemistry, Ice cores, Ionization, Ion density (concentration), Proton transport, Solar activity, Correlation, Greenland

53-808

**Unraveling the 10 micron "silicate" feature of protostars: the detection of frozen interstellar ammonia.**

Lacy, J.H., Faraji, H., Sandford, S.A., Allamandola, L.J., *Astrophysical journal letters*, July 1, 1998, 501(1)pt.2, p.L105-L109, 40 refs.

Extraterrestrial ice, Cosmic dust, Minerals, Infrared spectroscopy, Frozen liquids, Ice detection, Molecular structure, Hydrogen bonds, Spectra

53-809

**Proceedings.**

International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996, Smith, W.L., ed, Starnes, K., ed, Hampton, VA, A. DEEPAK Publishing, 1997, 1067p., Refs. passim. For selected papers see 53-810 through 53-860.

DLC QC912.3.I57 1996

Climatology, Cloud cover, Remote sensing, Polar atmospheres, Atmospheric composition, Optical properties, Aerosols, Radiation balance, Radiance, Cloud physics, Ice crystal optics, Ice crystal structure, Light scattering, Simulation

53-810

**Radiation in the Arctic: why worry?**

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Climatology, Polar atmospheres, Marine atmospheres, Radiation balance, Cloud physics, Optical properties, Ice crystal optics, Remote sensing, Models, Research projects

## 53-811

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Atmospheric boundary layer, Radiation balance, Cloud physics, Remote sensing, Albedo, Ice cover effect, Antarctica

## 53-812

**Model study of the effect of particulates on the albedo of sea ice.**

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DLC QC912.3.I57 1996

Sea ice, Ice floes, Optical properties, Ice composition, Sediments, Albedo, Radiation absorption, Particle size distribution, Radiometry, Models, Arctic Ocean

## 53-813

**Simulation of radiation and clouds with a regional climate model of the Arctic.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Radiation balance, Cloud cover, Surface temperature, Albedo, Models, Simulation, Arctic Ocean

## 53-814

**Measurements of the spectral optical depth of aerosols with moon and star light during polar night 1994/5 and 1995/6 in Ny-Alesund, Spitzbergen.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Haze, Optical properties, Photometry, Seasonal variations, Norway—Spitsbergen

## 53-815

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Cloud cover, Cloud physics, Ice crystal optics, Detection, Radiation balance, Lidar, Backscattering, Greenland—Thule

## 53-816

**Science issues and deployment schedule for the North Slope of Alaska and adjacent Arctic Ocean (NSA/AO) atmospheric radiation measurement (ARM) site.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Marine atmospheres, Optical properties, Radiation balance, Research projects, Environmental tests, Arctic Ocean, United States—Alaska—North Slope

## 53-817

**Arctic surface radiation variability and trend climatology from in situ data.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Atmospheric boundary layer, Radiation balance, Turbidity, Optical properties, Statistical analysis, Seasonal variations, Snow depth

## 53-818

**Cloud optical depth in the Arctic as estimated from surface radiation and satellite data.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Cloud cover, Optical properties, Ice crystal optics, Radiation balance, Radiance, Upwelling, Radiometry, Arctic Ocean

## 53-819

**Modelling and measurements of snow reflectance from visible to near infrared.**

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DLC QC912.3.I57 1996

Climatology, Snow cover effect, Snow optics, Grain size, Ice crystal optics, Reflectivity, Polarization (waves), Alpine landscapes, Models, France—Alps

## 53-820

**Effect of solar zenith angle on snow anisotropic reflectance.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Radiation balance, Solar radiation, Ice sheets, Snow optics, Snow cover, Albedo, Reflectivity, Anisotropy, Radiometry, Greenland

## 53-821

**Effects of the different types of the atmospheres on the surface and planetary albedos of snow.**

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DLC QC912.3.I57 1996

Climatology, Atmospheric composition, Optical properties, Snow optics, Albedo, Snow cover effect, Scattering, Radiation absorption, Spectra

## 53-822

**Evaluation of clear-sky downward longwave irradiance as observed in antarctic atmosphere.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Radiation balance, Water vapor, Radiance, Sounding, Radiometry, Statistical analysis, Antarctica

## 53-823

**Spectral downward longwave climatology for clear and cloudy skies over South Pole.**

Walden, V.P., Warren, S.G., International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996. Proceedings. IRS '96: current problems in atmospheric radiation. Edited by W.L. Smith and K. Stamnes, Hampton, VA, A. DEEPAK Publishing, 1997, p.54-57, 12 refs.

DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Cloud cover, Classifications, Radiation balance, Radiance, Seasonal variations, Spectroscopy, Antarctica—South Pole

## 53-824

**Monitoring the temperature inversion at 11 and 6.7μm.**

Ackerman, S.A., International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996. Proceedings. IRS '96: current problems in atmospheric radiation. Edited by W.L. Smith and K. Stamnes, Hampton, VA, A. DEEPAK Publishing, 1997, p.58-61, 3 refs.

DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Air temperature, Cloud cover, Temperature inversions, Radiance, Radiometry, Brightness, Antarctica

## 53-825

**Radiation and surface fluxes measurements at Terra Nova Bay (Antarctica).**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Cloud cover, Radiation balance, Surface energy, Radiometry, Antarctica—Terra Nova Bay

## 53-826

**Effect of surface topography on the radiation environment of Palmer Station, Antarctica.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Radiation balance, Atmospheric boundary layer, Radiance, Albedo, Topographic effects, Snow cover effect, Simulation, Antarctica—Palmer Station

## 53-827

**Characterization of arctic haze by infrared emission: a feasibility study.**

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DLC QC912.3.I57 1996

Climatology, Polar atmospheres, Infrared radiation, Optical properties, Haze, Aerosols, Infrared spectroscopy, Attenuation, Models

53-828

**Determination of a radiatively equivalent micro-physic for cirrus clouds during EUCREX'94—sensitivity of radiative fluxes to the microphysic.** Chepfer, H., et al, International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996. Proceedings. IRS '96: current problems in atmospheric radiation. Edited by W.L. Smith and K. Stamnes, Hampton, VA, A. DEEPAK Publishing, 1997, p.86-89, 10 refs.

DLC QC912.3.I57 1996

Climatology, Cloud physics, Ice crystal optics, Light scattering, Sounding, Aerial surveys, Models, France

53-829

**Remote sounding of multilayer cirrus cloud systems using AVHRR data collected during FIRE-II-IFO.**

Ou, S.C., Liou, K.N., International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996. Proceedings. IRS '96: current problems in atmospheric radiation. Edited by W.L. Smith and K. Stamnes, Hampton, VA, A. DEEPAK Publishing, 1997, p.93-96, 7 refs.

Climatology, Cloud physics, Ice crystal optics, Ice crystal size, Radiometry, Sounding, Replicas, Probes, United States—Kansas—Coffeyville

53-830

**Aircraft multi-spectral radiance measurements of cirrus during EUCREX'93, and their application to the retrieval of the clouds' microphysical and radiative properties.**

Hignett, P., Francis, P.N., Macke, A., International Radiation Symposium, Fairbanks, AK, Aug. 19-24, 1996. Proceedings. IRS '96: current problems in atmospheric radiation. Edited by W.L. Smith and K. Stamnes, Hampton, VA, A. DEEPAK Publishing, 1997, p.101-104, 3 refs.

DLC QC912.3.I57 1996

Climatology, Cloud physics, Ice crystal optics, Ice crystal structure, Scattering, Reflectivity, Radiance, Aerial surveys

53-831

**Comparison between cloud bidirectional reflectances observed by POLDER and simulations based on the cloud microphysics used in the ISCCP scheme.**

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DLC QC912.3.I57 1996

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Climatology, Precipitation (meteorology), Storms, Cloud physics, Ice crystal optics, Ice detection, Reflectivity, Radiometry

53-837

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Climatology, Cloud physics, Ice physics, Light scattering, Ice crystal optics, Ice crystal structure, Bubbles, Aerosols, Impurities

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Climatology, Radiation balance, Attenuation, Condensation trails, Cloud physics, Ice crystal optics, Ice crystal growth, Aerosols, Models

53-840

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53-841

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Climatology, Polar atmospheres, Profiles, Radiation balance, Radiance, Spectra, Models, Antarctica—South Pole

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Climatology, Polar atmospheres, Cloud physics, Cloud height indicators, Radiation balance, Water content, Particle size distribution, Probes, Temperature effects, Aerial surveys

53-843

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DLC QC912.3.I57 1996

Climatology, Cloud physics, Radiance, Optical properties, Aerial surveys, Radar echoes, Albedo, Particle size distribution, Ice crystal optics, Ice crystal structure

53-844

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53-845

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Climatology, Polar atmospheres, Cloud physics, Radiance, Sounding, Particle size distribution, Spectra, Norway—Svalbard

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Climatology, Polar atmospheres, Cloud physics, Radiation balance, Optical properties, Sounding, Radiometry, Aerial surveys, United States—Alaska—North Slope, United States—Alaska—Prudhoe Bay

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Geophysical surveys, Arctic landscapes, Deserts, Radiometry, Brightness, Soil temperature, Surface temperature, Diurnal variations, Seasonal variations, Antarctica—McMurdo Dry Valleys

## 53-851

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Climatology, Cloud physics, Radiometry, Infrared spectroscopy, Cloud droplets, Ice crystal optics, Ice crystal size, Cloud height indicators, Image processing

## 53-852

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Climatology, Remote sensing, Cloud physics, Cloud height indicators, Ice crystal optics, Ice crystal size, Brightness, Radiometry, Lidar, Correlation

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## 53-855

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Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Infrared spectroscopy, Turbulent diffusion, Seasonal variations, United States—Alaska—Poker Flat

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## 53-859

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Climatology, Air pollution, Cloud cover, Degradation, Ozone, Ultraviolet radiation, Radiance, Environmental impact, Environmental protection, Ecosystems, Marine biology, Spectroscopy, Theories, Antarctica—Palmer Station

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## 53-863

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53-865

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53-866

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53-869

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53-870

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53-871

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53-872

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53-873

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Cloud cover, Cloud physics, Solar radiation, Ice crystal optics, Ice crystal structure, Optical phenomena, Light transmission, Computerized simulation, Finland

53-874

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53-875

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53-876

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53-878

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53-879

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53-880

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53-881

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53-882

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53-883

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53-884

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53-885

**Hydroclimatology of Illinois: a comparison of monthly evaporation estimates based on atmospheric water balance and soil water balance.**

Yeh, P.J.F., Irizarry, M., Eltahir, E.A.B., *Journal of geophysical research*, Aug. 27, 1998, 103(D16), p.19,823-19,837, 67 refs.

Hydrologic cycle, Precipitation (meteorology), Snow hydrology, Soil water, Soil air interface, Evaporation, Snow depth, Wind factors, Statistical analysis, Mathematical models, Seasonal variations, Forecasting, United States—Illinois

## 53-886

**Sintering in a dry snow cover.**

Colbeck, S.C., MP 5240, *Journal of applied physics*, Oct. 15, 1998, 84(8), p.4585-4589, 10 refs.

Snow physics, Snow strength, Snow cover structure, Snow crystal growth, Snow crystal structure, Microstructure, Sintering, Diffusion, Physical properties, Analysis (mathematics), Theories

The basic shape of bonds in snow is dictated by the geometrical requirements of grain-boundary grooves and is not a simple concave neck as has long been assumed. In fact, all of the earlier work on the theory of sintering in snow was based on an incorrect assumption about the geometry. A theory of the growth of bonds in snow is given here based on observations of their actual shape which is dominated by grain-boundary grooves. The theory describes the growth of the bond by the removal of water molecules from the grain boundary by diffusion due to the stress gradient. Three-dimensional grains are described and the dihedral angle is allowed to increase with time.

## 53-887

**Response of the Ha! Ha! River to the flood of July 1996 in the Saguenay region of Quebec: large-scale avulsion in a glaciated valley.**

Lapointe, M.F., Secretan, Y., Driscoll, S.N., Bergeron, N., Leclerc, M., *Water resources bulletin*, Sep. 1998, 34(9), p.2383-2392, 40 refs.

Geomorphology, River basins, Floodplains, Flooding, Sedimentation, Water erosion, Glacial geology, Glacial deposits, Landscape development, Runoff, Flow measurement, Canada—Quebec—Ha! Ha! River

## 53-888

**Biomagnification and bioaccumulation of mercury in an arctic marine food web: Insights from stable nitrogen isotope analysis.**

Atwell, L., Hobson, K.A., Welch, H.E., *Canadian journal of fisheries and aquatic sciences*, May 1998, 55(5), p.1114-1121, With French summary, 47 refs.

Water pollution, Subpolar regions, Ecosystems, Marine biology, Biomass, Sampling, Metals, Isotope analysis, Environmental impact, Environmental tests, Canada—Northwest Territories—Lancaster Sound

## 53-889

**Numerical simulations of sea and land breezes at high latitudes.**

Grønås, S., Sandvik, A.D., *Tellus*, Aug. 1998, 50A(4), p.468-489, 50 refs.

Climatology, Polar atmospheres, Atmospheric boundary layer, Atmospheric circulation, Marine atmospheres, Wind direction, Ice air interface, Snow cover effect, Ice cover effect, Topographic effects, Seasonal variations, Mathematical models, Norway—Spitsbergen

## 53-890

**Structure and biodiversity of megabenthos in the Weddell and Lazarev Seas (Antarctica): ecological role of physical parameters and biological interactions.**

Gutt, J., Starmans, A., *Polar biology*, Oct. 1998, 20(4), p.229-247, Refs. p.245-247.

Marine biology, Ecosystems, Ocean bottom, Biomass, Sampling, Classifications, Statistical analysis, Photography, Antarctica—Weddell Sea

## 53-891

**Freeze resistance of Pacific northwest strawberry flowers.**

Hummel, R.L., Moore, P.P., *American Society for Horticultural Science. Journal*, Mar. 1997, 122(2), p.179-182, 20 refs.

Plant physiology, Cold tolerance, Frost resistance, Plant tissues, Chemical composition, Ice nuclei, Ice crystal growth, Damage, Supercooling, Freezing points, Cold weather tests

## 53-892

**Investigation of joint spalling on concrete runway.**

Rollings, R.S., Burkes, J.P., Hammons, M.I., Wong, G.S., Rollings, M.P., *Journal of performance of constructed facilities*, Feb. 1998, 12(1), p.12-19, 4 refs.

Concrete pavements, Concrete durability, Runways, Concrete freezing, Joints (junctions), Concrete aggregates, Damage, Freeze thaw cycles, Crack propagation, Mechanical properties, Drill core analysis

## 53-893

**Role of cold-responsive genes in plant freezing tolerance.**

Thomashow, M.F., *Plant physiology*, Sep. 1998, 118(1), p.1-7, 31 refs.

Plant physiology, Plant tissues, Cryobiology, Antifreezes, Acclimatization, Frost resistance, Cold tolerance, Chemical composition, Chemical analysis, Molecular structure, Modification

## 53-894

**Equilibrium structural model of liquid water: evidence from heat capacity, spectra, density and other properties.**

Dougherty, R.C., Howard, L.N., *Journal of chemical physics*, Nov. 1, 1998, 109(17), p.7379-7393, 64 refs.

Water structure, Molecular structure, Hydrogen bonds, Heat capacity, Thermodynamic properties, Density (mass/volume), Supercooling, Temperature effects, Models, Statistical analysis

## 53-895

**Effect of the structure of ice on the aggregation state of co-adsorbed formic acid.**

Trakhtenberg, S., Naaman, R., *Thin solid films*, Aug. 31, 1998, Vol.327-328, International Conference on Organized Molecular Films, 8th, Pacific Grove, CA, Aug. 24-29, 1997. Proceedings, p.499-502, 11 refs.

Ice physics, Amorphous ice, Ice vapor interface, Adsorption, Aggregates, Ice structure, Molecular structure, Organic nuclei, Phase transformations, Infrared spectroscopy, Spectra, Temperature effects

## 53-896

**Identification of the ice-binding surface on a type III antifreeze protein with a "flatness function" algorithm.**

Yang, D.S.C., et al, *Biophysical journal*, May 1998, 74(5), p.2142-2151, Refs. p.2150-2151.

Antifreezes, Ice crystal growth, Adsorption, Ice water interface, Ice crystal adhesion, Ice crystal structure, Mathematical models, Surface properties

## 53-897

**Flashover performance of ice-covered insulators. [Contournement électrique des isolateurs recouverts de glace]**

Farzaneh, M., Kiernicki, J., *Canadian journal of electrical and computer engineering*, July 1997, 22(3), p.95-109, In French with English summary, 82 refs.

Electrical insulation, Ice cover effect, Cold weather performance, Low temperature research, Simulation, Experimentation, Power line icing, Electric corona

## 53-898

**Survival and recovery of 'Meyer' zoysiagrass rhizomes after extracellular freezing.**

Warmund, M.R., Fuller, R., Dunn, J.H., *American Society for Horticultural Science. Journal*, Sep. 1998, 123(5), p.821-825, 21 refs.

Plant physiology, Grasses, Plant tissues, Roots, Microstructure, Growth, Cold tolerance, Ice formation, Interstitial ice, Cold weather tests, Temperature effects, Freeze thaw tests, Scanning electron microscopy

## 53-899

**Simulation of the water and carbon monoxide production rates of comet Hale-Bopp using a quasi 3-D nucleus model.**

Enzian, A., Cabot, H., Klinger, J., *Planetary and space science*, Aug. 1998, 46(8), p.851-858, 29 refs.

Extraterrestrial ice, Satellites (natural), Ice physics, Amorphous ice, Aggregates, Porous materials, Ice sublimation, Vapor diffusion, Mathematical models, Thermal analysis

## 53-900

**Simulation of gas flow in a cometary Knudsen layer.**

Skorov, I.U.V., Rickman, H., *Planetary and space science*, Aug. 1998, 46(8), p.975-996, 24 refs.

Extraterrestrial ice, Satellites (natural), Ice physics, Ice composition, Porous materials, Dust, Vapor diffusion, Ice sublimation, Simulation, Mathematical models

## 53-901

**Geothermal modeling of soil or mine tailings with concurrent freezing and deposition.**

Nixon, J.F., Holl, N., *Canadian geotechnical journal*, Apr. 1998, 35(2), p.234-250, With French summary, 12 refs.

Soil mechanics, Tailings, Embankments, Sedimentation, Ground thawing, Geothermal thawing, Frozen ground mechanics, Layers, Freeze thaw cycles, Unfrozen water content, Snow cover effect, Mathematical models, Forecasting, Canada—Saskatchewan—Key Lake

## 53-902

**Concentrations of trace elements in recent and preindustrial sediments from Norwegian and Russian arctic lakes.**

Rognerud, S., Skotvold, T., Fjeld, E., Norton, S.A., Hobæk, A., *Canadian journal of fisheries and aquatic sciences*, June 1998, 55(6), p.1512-1523, With French summary, 57 refs.

Lacustrine deposits, Limnology, Arctic landscapes, Air pollution, Aerosols, Metals, Grain size, Lithology, Scavenging, Drill core analysis, Statistical analysis, Russia—Siberia, Norway—Svalbard

## 53-903

**Changes of mean sea level and ice condition in Gdynia as indicators of climate changes in the Gulf of Gdańsk.**

Sztobryn, M., Kańs, M., Staskiewicz, A., NATO Advanced Research Workshop on Sensitivity of North Sea, Baltic Sea and Black Sea to Anthropogenic and Climatic Changes, Varna, Bulgaria, Nov. 14-18, 1995. Proceedings. ASI, Series 2. Environment. Vol.27. Edited by E. Özsoy and A. Mikaelyan, Dordrecht, Kluwer Academic Publishers, 1997, p.1-9, 10 refs.

DLC GC681.S43 1997

Oceanography, Hydrology, Climatic changes, Sea level, Storms, Water transport, Sea ice, Ice conditions, Seasonal variations, Statistical analysis, Poland—Gdańsk, Gulf

## 53-904

**Convection in the Baltic Sea—a numerical process study.**

Backhaus, J.O., Wehde, H., NATO Advanced Research Workshop on Sensitivity of North Sea, Baltic Sea and Black Sea to Anthropogenic and Climatic Changes, Varna, Bulgaria, Nov. 14-18, 1995. Proceedings. ASI, Series 2. Environment. Vol.27. Edited by E. Özsoy and A. Mikaelyan, Dordrecht, Kluwer Academic Publishers, 1997, p.295-309, 41 refs.

DLC GC681.S43 1997

Oceanography, Subpolar regions, Water temperature, Convection, Ventilation, Stratification, Turbulent diffusion, Models, Profiles, Thermodynamics, Baltic Sea

## 53-905

**Ice/ocean model for North and Baltic Sea.**

Schrum, C., NATO Advanced Research Workshop on Sensitivity of North Sea, Baltic Sea and Black Sea to Anthropogenic and Climatic Changes, Varna, Bulgaria, Nov. 14-18, 1995. Proceedings. ASI, Series 2. Environment. Vol.27. Edited by E. Özsoy and A. Mikaelyan, Dordrecht, Kluwer Academic Publishers, 1997, p.311-325, 32 refs.

DLC GC681.S43 1997

Oceanography, Climatology, Subpolar regions, Ocean currents, Surface temperature, Sea ice distribution, Ice growth, Salinity, Water temperature, Stratification, Seasonal variations, Computerized simulation, North Sea, Baltic Sea



53-906

**Quantification of transports to Skagerrak.**

Skogen, M.D., Eriksen, G., Svendsen, E., NATO Advanced Research Workshop on Sensitivity of North Sea, Baltic Sea and Black Sea to Anthropogenic and Climatic Changes, Varna, Bulgaria, Nov. 14-18, 1995. Proceedings. ASI, Series 2. Environment. Vol.27. Edited by E. Özsoy and A. Mikaelian, Dordrecht, Kluwer Academic Publishers, 1997, p.327-339, 35 refs.

DLC GC681.S43 1997

Oceanography, Subpolar regions, Ocean currents, Hydrography, Water transport, Wind factors, Biomass, Sediment transport, Hydrodynamics, Models, North Sea

53-907

**Proceedings. Cold regions impact on civil works.**

International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998, Newcomb, D.E., ed, Reston, VA, American Society of Civil Engineers (ASCE), 1998, 766p., Refs. passim. For individual papers see 53-908 through 53-977.

DLC TA713.I55 1998

Cold weather construction, Road maintenance, Pavements, Subgrade soils, Soil freezing, Frost penetration, Frost action, Frost resistance, Frost protection, Soil stabilization, Geotextiles, Winter concreting

53-908

**Blue Earth County Superpave Level I Project CSAH 8 from TH 22 to TR 167.**

Forsberg, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.1-11.

DLC TA713.I55 1998

Pavements, Paving, Bitumens, Aggregates, Road maintenance, Cold weather construction, Cold weather tests, Cost analysis, United States—Minnesota

53-909

**Stearns County Superpave Project CSAH 75.**

Weiszhaar, D.J., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.12-19, 1 ref.

DLC TA713.I55 1998

Pavements, Paving, Bitumens, Road maintenance, Cold weather construction, Cold weather tests, Cost analysis, United States—Minnesota

53-910

**Thermal contraction of an asphalt concrete mixture.**

Zeng, H.Y., Vinson, T.S., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.20-33, 19 refs.

DLC TA713.I55 1998

Bituminous concretes, Concrete pavements, Thermal stresses, Cold stress, Frost action, Cracking (fracturing), Cold weather tests, Low temperature tests, Thermal analysis, Structural analysis

53-911

**Pavement thermal impact on discontinuous permafrost.**

Nidowicz, B., Shur, I.U.L., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.34-45, 18 refs.

DLC TA713.I55 1998

Permafrost beneath roads, Discontinuous permafrost, Active layer, Permafrost thermal properties, Permafrost heat transfer, Permafrost preservation, Frost penetration, Thaw depth, Road maintenance

53-912

**Improving prediction of frost penetration.**

Cole, S.W., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.46-56, 4 refs.

DLC TA713.I55 1998

Soil freezing, Frozen ground thermodynamics, Freezing front, Frost penetration, Geothermy, Soil temperature, Freezing indexes, Frost forecasting, Mathematical models

53-913

**Case study: shallow insulated foundation failure due to frost action.**

Woodworth, J.R., Lyytinen, K.A., Krzewinski, T.G., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.57-69, 2 refs.

DLC TA713.I55 1998

Houses, Foundations, Frost penetration, Frost protection, Thermal insulation, Frost action, Settlement (structural), Cold weather construction, United States—Minnesota—Duluth

53-914

**Russian construction complex in transition to market economy.**

Shishkin, A.A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.70-75.

DLC TA713.I55 1998

Houses, Residential buildings, Cold weather construction, Regional planning, Economic development, Cost analysis, Russia—Karelia

53-915

**Description and a thermal study of an exterior insulation and finish system used in China.**

Yi, C., Xu, P., Sui, C.F., Pang, Z.Y., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.76-85, 4 refs.

DLC TA713.I55 1998

Residential buildings, Walls, Thermal insulation, Heating, Weatherproofing, Cold weather construction, China

53-916

**Considerations for deactivating Army buildings in Alaska.**

Flanders, S.N., MP 5241, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.86-95, 2 refs.

DLC TA713.I55 1998

Military facilities, Buildings, Utilities, Cold weather construction, Weatherproofing, Thermal analysis, Cost analysis, United States—Alaska

Three buildings on Army bases in Alaska (a barracks and a theater at Fort Richardson, near Anchorage, and a single-family housing unit at Fort Greely, near Delta Junction and 90 miles southeast of Fairbanks) were deactivated to study strategies to allow them to be unheated and subsequently reactivated with minimum expense. The study demonstrated that draining plumbing systems, recharging them with propylene glycol, and redraining them effectively minimized damage. Damage to interior finish was minimal after 2.3 years. Life-cycle energy cost calculations indicated that deactivating a single-family dwelling would save between \$3,800 and \$7,300 per year, depending on location, and that deactivating a barracks would save between \$17,300 and \$33,400 per year, depending on location, versus keeping them heated. The product of the study was an easy-to-follow *Handbook for Activation and Deactivation of Buildings*.

53-917

**Wastewater lagoons for cold regions.**

McAnaney, D.W., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.96-106, 5 refs.

DLC TA713.I55 1998

Sewage disposal, Waste treatment, Water treatment, Cold weather operation, Sanitary engineering, Ponds, Aeration, Bacteria, Microbiology, Sludges

53-918

**Wastewater treatment plant odor control using a biofiltration system in Duluth, Minnesota.**

Boyette, R.A., Bergstedt, L., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.107-118, 3 refs.

DLC TA713.I55 1998

Sewage disposal, Waste treatment, Water treatment, Cold weather operation, Sanitary engineering, Microbiology, Air flow, Filters, Cost analysis, United States—Minnesota—Duluth

53-919

**Treatment by freeze-thaw of membrane concentrates.**

Facey, R.M., Smith, D.W., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.119-130, 3 refs.

DLC TA713.I55 1998

Water pollution, Water treatment, Waste treatment, Waste disposal, Sanitary engineering, Frozen liquids, Artificial freezing, Artificial thawing

53-920

**Variable slip friction measurement techniques for snow and ice operations.**

Fleege, E.J., Wambold, J.C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.131-142, 3 refs.

DLC TA713.I55 1998

Road icing, Rubber ice friction, Rubber snow friction, Skid resistance, Monitors, Salting, Road maintenance

53-921

**Snow deformation beneath a vertically loaded plate formation of pressure bulb with limited lateral displacement.**

Shoop, S.A., Alger, R.G., MP 5242, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.143-150, 5 refs.

DLC TA713.I55 1998

Snow strength, Snow hardness, Snow compression, Snow density, Snow deformation, Snow vehicles, Trafficability, Bearing tests

The development of models to predict mobility over snow-covered terrains relies on a thorough understanding of the reaction of a snow mass to a vehicle load. Field experiments analyzing snow deformation under vehicles presented questions regarding the extent of lateral deformation beneath a track or wheel and the cause of lateral deformation. Thus, experiments to examine the deformation of snow under a vertically loaded plate were performed in the laboratory. The experiments show that there is often very little lateral movement of the snow even though the vertical deformation extends beyond the boundaries of the plate, giving the appearance of lateral deformation. The existence of any lateral deformation is limited and is dependent on the snow density, aging, and possibly the load rate. Lateral expansion did not occur in snow with densities less than 0.25 g/cc. Also, dependent upon the degree of particle disturbance, aging of as little as 2 hours can cause what appears to be lateral displacement, but is more likely the particles acting as a bonded mass instead of as individuals.



## 53-922

**Ice expansion.**

Koscik, K., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.151-155.

DLC TA713.155 1998

Lake ice, Ice push, Ice erosion, Shore erosion, Ice control, United States—Wisconsin

## 53-923

**Superpave™ runway in the "Icebox of the Nation".**

Wegman, D., Solsaa, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.156-161, 6 refs.

DLC TA713.155 1998

Runways, Pavements, Bitumens, Polymers, Frost protection, Cold weather construction, United States—Minnesota—International Falls

## 53-924

**Thermal stress restrained specimen test user survey.**

Vinson, T.S., Hicks, R.G., Whiting, B., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.162-175, 12 refs.

DLC TA713.155 1998

Bituminous concretes, Concrete pavements, Thermal stresses, Cold stress, Cracking (fracturing), Frost resistance, Cold weather tests, Low temperature tests, Road maintenance

## 53-925

**Constructability of polymer-modified asphalts in Alaska.**

Aleshire, L., Mann, M., Zubeck, H., Raad, L., Ryer, J., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.176-187, 14 refs.

DLC TA713.155 1998

Pavements, Bitumens, Polymers, Frost resistance, Cold weather tests, Road maintenance, United States—Alaska

## 53-926

**Improved spring load restriction guidelines using mechanistic analysis.**

Van Deusen, D., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.188-199, 17 refs.

DLC TA713.155 1998

Pavements, Ground thawing, Thaw depth, Thaw weakening, Frost forecasting, Weather forecasting, Highway planning, Road maintenance, United States—Minnesota

## 53-927

**Predicting strength of subgrades during spring thaw with seismic methods.**

Mactutis, J., Nazarian, S., Picornell, M., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.200-211, 4 refs.

DLC TA713.155 1998

Pavements, Subgrade soils, Ground thawing, Thaw depth, Thaw weakening, Soil strength, Soil trafficability, Freeze thaw tests, Road maintenance

## 53-928

**Ground water remediation/frozen soil reactor gates.**

Andersland, O.B., Criddle, C.S., Wallace, R.B., Wiggert, D.C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.212-223, 13 refs.

DLC TA713.155 1998

Oil spills, Soil pollution, Ground water, Water pollution, Artificial freezing, Soil freezing, Soil stabilization, Land reclamation, Water treatment

## 53-929

**Thermally enhanced bioventing at a cold regions UST site: a case study.**

Filler, D.M., Carlson, R.F., Zarling, J.P., Arambarri, J.W., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.224-235, 9 refs.

DLC TA713.155 1998

Oil storage, Storage tanks, Underground storage, Oil spills, Soil pollution, Permafrost control, Frozen ground thermodynamics, Thermal insulation, Heating, Aeration, Soil microbiology, Land reclamation, United States—Alaska—Fairbanks

## 53-930

**Cyanide degradation in a pilot scale SBBR.**

Pilon, T.A., White, D.M., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.236-242, 9 refs.

DLC TA713.155 1998

Gold, Tailings, Leaching, Soil pollution, Water pollution, Water treatment, Waste disposal, Microbiology, Land reclamation

## 53-931

**Management of winter diffuse pollution from urban areas: effect of drainage and deicing operations.**

Smith, D.W., Facey, R.M., Novotny, V., Kuemmel, D.A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.243-257, 6 refs.

DLC TA713.155 1998

Salting, Chemical ice prevention, Snow removal, Snowmelt, Salting, Chemical ice prevention, Water pollution, Soil pollution, Drains, Sanitary engineering, Municipal engineering, Environmental protection

## 53-932

**Low-temperature repair of the ice condenser floor slab at the Sequoyah Nuclear Power Plant.**

Korhonen, C.J., Hughes, J., Best, F., Mass, G., MP 5243, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.258-270, 7 refs.

DLC TA713.155 1998

Nuclear power, Cooling systems, Floors, Lightweight concretes, Concrete slabs, Concrete freezing, Concrete curing, Concrete placing, Winter concreting, Concrete admixtures, Antifreezes, Water cement ratio, Frost resistance, Frost protection, United States—Tennessee—Chattanooga

A lightweight portland cement concrete was pumped more than 100 m horizontally and 10 m vertically and placed, finished, and cured at below-freezing temperatures with minimal thermal protection. A low-temperature accelerator, two plasticizers, and a low w/cm (water/cementitious) ratio produced the desired results.

## 53-933

**Intake canal modifications improve power plant efficiency.**

Toso, J., Larson, J., Gehlhar, J., Hathaway, C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.271-281, 4 refs.

DLC TA713.155 1998

Electric power, Water intakes, Channels (waterways), Water flow, Flow control, Water temperature, Temperature control, Cooling systems

## 53-934

**Natural dewatering of alum sludge in freezing beds.**

Martel, C.J., MP 5244, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.282-291, 9 refs.

DLC TA713.155 1998

Sludges, Water treatment, Waste treatment, Sewage disposal, Freeze drying, Artificial freezing, Artificial thawing, Ponds, Sanitary engineering

After several years of research, the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) has developed a new unit operation for dewatering sludge called a sludge freezing bed. It differs from other natural freezing operations in that it maximizes the amount of sludge that can be frozen. The freezing bed is a particularly attractive alternative for dewatering alum sludge, because no conditioning chemicals are required and the remaining granular material can be left to accumulate in the bed for several years. Equations are presented that can be used to size the freezing bed according to local climatic conditions.

## 53-935

**Mechanical implications of using insulation layers in pavements.**

Doré, G., Konrad, J.M., Roy, M., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.292-303, 6 refs.

DLC TA713.155 1998

Pavements, Frost resistance, Frost protection, Thermal insulation, Freeze thaw tests, Strain tests, Road maintenance

## 53-936

**Modelling of road surface temperatures in winter.**

Kilpeläinen, M., Ravaska, O., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.304-315, 7 refs.

DLC TA713.155 1998

Road icing, Pavements, Surface temperature, Air temperature, Frost penetration, Frost forecasting, Weather forecasting, Road maintenance, Computerized simulation

## 53-937

**Spreading measurements and longitudinal cracking: Sheep Creek-Goldstream Road, Fairbanks, Alaska.**

Scher, R.L., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.316-327, 8 refs.

DLC TA713.155 1998

Pavements, Cracking (fracturing), Permafrost beneath roads, Frost action, Road maintenance, United States—Alaska—Fairbanks

## 53-938

**Geotextile-reinforced pavement over spreading embankments: Goldstream Road, Alaska (performance 1994-1998).**

Scher, R.L., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.328-338, 9 refs.  
DLC TA713.I55 1998

Pavements, Cracking (fracturing), Embankments, Permafrost beneath roads, Frost action, Frost protection, Geotextiles, Soil stabilization, Road maintenance, United States—Alaska—Fairbanks

## 53-939

**Interface friction of a soil-fabric-aggregate system.**

Bearden, J., Labuz, J., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.339-350, 9 refs.  
DLC TA713.I55 1998

Roadbeds, Gravel, Aggregates, Geotextiles, Subgrade soils, Soil stabilization, Subgrade maintenance, Road maintenance

## 53-940

**Hydraulic behaviour of geosynthetics in freezing conditions.**

Larivière, S., Lafleur, J., Savard, Y., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.351-361, 9 refs.  
DLC TA713.I55 1998

Pavements, Geotextiles, Drains, Subsurface drainage, Frost protection, Road maintenance

## 53-941

**Detecting ice jam events.**

Zufelt, J.E., MP 5245, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.362-372, 10 refs.  
DLC TA713.I55 1998

River ice, Ice jams, Ice detection, Ice forecasting, Ice control, Warning systems  
Ice jams result in over \$125 million in damages annually across the northern United States. In many communities, ice jams are a recurrent threat, prompting mitigation measures to minimize their impact. Some ice jam control measures are designed to operate successfully with little or no human intervention or control, such as an ice control structure designed to retain ice upstream of a community. Other forms of ice control may require operational measures: a crane or backhoe placed at a bridge and only utilized when ice becomes jammed in the opening during an ice run. Identification of when and where ice jams occur is key to the successful design, construction, and operation of ice jam mitigation schemes. This paper presents a compilation of methods used to infer or detect when and where an ice jam has occurred or is impending.

## 53-942

**Modeling ice-covered rivers using HEC-RAS.**

Daly, S.F., Brunner, G.W., Piper, S., Jensen, M., Tuthill, A.M., MP 5246, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.373-383, 14 refs.  
DLC TA713.I55 1998

River ice, Ice jams, Ice cover thickness, Ice conditions, Ice loads, Ice water interface, River flow, Ice forecasting, Mathematical models, Computerized simulation

The ability to model ice-covered channels has been added to the Hydrologic Engineering Center's River Analysis System (HEC-RAS). The ice cover thickness and hydraulic roughness can be entered by the user, or the ice cover can be modeled as a wide-river ice jam, in which case the jam thickness is estimated by HEC-RAS. For the wide-river jam, the user enters the material properties of the ice jam and its extent. Information describing the ice cover and ice properties can be entered for each individual cross section using an ice information editor or can be entered for a number of cross sec-

tions using a table. Results can be viewed in tabular or graphical form. Graphical output includes cross section plots, profile plots, and perspective plots displaying the ice cover extent and thickness. In addition, profile plots of other ice information, such as thickness and volume, can be readily displayed.

## 53-943

**Case history: design of river crossings for the Trans-Alaska Fiber Optic Cable.**

Thomas, H.P., Selbig, J.W., Hall, R.L., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.384-396, 5 refs.  
DLC TA713.I55 1998

Cables (ropes), Transmission lines, Data transmission, Underground pipelines, Pipe laying, River crossings, Water erosion, Flood control, United States—Alaska

## 53-944

**City of Duluth long term street improvement program-history: current practice and future considerations.**

Prusak, D.J., Krzewinski, T.G., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.397-407, 7 refs.  
DLC TA713.I55 1998

Urban planning, Highway planning, Road maintenance, Streets, Pavements, Subgrade soils, Frost penetration, Frost action, Frost protection, Cold weather construction, Cost analysis, United States—Minnesota—Duluth

## 53-945

**Blue Earth County Finn Road/Oil Gravel Project CSAH 24 from Th 30 to CSAH 25.**

Forsberg, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.408-419.  
DLC TA713.I55 1998

Pavements, Bitumens, Aggregates, Gravel, Road maintenance, Subgrade maintenance, Cost analysis, United States—Minnesota

## 53-946

**Instrumentation of reinforcement, separation and drainage geosynthetic test sections used in the reconstruction of a highway in Maine.**

Hayden, S.A., Christopher, B.R., Humphrey, D.N., Fetton, C., Dunn, P.A., Jr., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.420-433, 7 refs.  
DLC TA713.I55 1998

Pavements, Subgrade soils, Frost action, Geotextiles, Drainage, Soil stabilization, Frost protection, Road maintenance, Subgrade maintenance, United States—Maine

## 53-947

**Reducing frost heave with capillary barriers: Interim results.**

Henry, K.S., Holtz, R.D., Ellis, E., MP 5247, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.434-436.  
DLC TA713.I55 1998

Subgrade soils, Soil freezing, Frost heave, Frost protection, Soil water migration, Capillarity, Geotextiles, Soil stabilization, Vapor barriers, Waterproofing, Subgrade maintenance, Road maintenance

Capillary barriers are placed between the water table and the freezing front in soils to potentially reduce/prevent frost heave above the barrier by restricting water flow to the freezing front. Research about the use of geosynthetic capillary barriers in pavements so that fine-grained soils might be allowed in the structural section is now being conducted. Geotextiles and geocomposites were placed in frost-sus-

ceptible soil that was frozen at conditions representative of those in the field. Results indicate that geotextiles as received from the manufacturer were effective capillary barriers, but they were markedly less effective after they are moistened and have soil fines in them. Moistened geocomposites containing soil fines were more effective capillary barriers than moistened geotextiles for the soil and conditions tested.

## 53-948

**Experiments on frost heaving force of ground anchor.**

Nishikawa, J., Kaneta, H., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.437-446, 4 refs.  
DLC TA713.I55 1998

Soil freezing, Frost heave, Anchors, Frost protection, Soil stabilization, Slope protection, Frozen ground compression, Soil pressure

## 53-949

**Tilttable windtunnel for investigating icing of planar surfaces.**

Streitz, J., Ettema, R., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.447-456, 2 refs.  
DLC TA713.I55 1998

Road icing, Aircraft icing, Ice accretion, Glaze, Naleds, Ice loads, Wind tunnels, Environmental tests

## 53-950

**Ice-cover thickening at river-reservoir confluences: a case study.**

White, K.D., Acone, S.E., MP 5248, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.457-466, 17 refs.  
DLC TA713.I55 1998

River ice, Ice breakup, Frazil ice, Ice growth, Ice jams, Ice forecasting, Reservoirs, Flood forecasting, Mathematical models, Computerized simulation, United States—Maine—Fort Fairfield

Breakup ice jams commonly form at locations where the river slope changes from steep to mild, such as river-reservoir confluence areas. Several mechanisms favor the formation of ice jams at these locations, including hydraulic (e.g., changes in discharge and stage may result in breakup of the ice cover on the river but not on the reservoir). In some cases, frazil ice deposition results in thicker ice at the confluence than in the river upstream, thus providing increased resistance to the breakup and transport of ice through the confluence area. The Aroostook River at Fort Fairfield, ME, provides an example of this situation. Breakup ice jams that form at the confluence of the river and the pool formed by Tinker Dam have caused severe flooding in Fort Fairfield. The present analysis addresses two possible causes of ice thickening at the confluence: shoving during initial ice-cover formation and frazil deposition after initial ice-cover formation. The location and thickness of frazil ice deposits has traditionally been predicted using a critical velocity criterion. However, in a number of locations, including the Aroostook River, field data indicate that this criterion is inadequate. Recently developed frazil transport theory shows promise as a more accurate predictor of frazil deposition.

## 53-951

**Case study: an in-water winter boat storage program.**

Wortley, C.A., Wolf, C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.467-478, 5 refs.  
DLC TA713.I55 1998

Ports, Docks, Lake ice, Ice conditions, Ice control, Cold weather operation, Cost analysis, United States—Ohio—Erie, Lake

## 53-952

**Performance of fiber reinforced concrete with respect to frost resistance: a case study.**

Xu, P., Yi, C., Fan, C.M., Joshi, R.C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.479-488, 7 refs.

DLC TA713.I55 1998

Concrete pavements, Reinforced concretes, Concrete durability, Concrete strength, Frost resistance, Freeze thaw tests, Cold weather tests, Road maintenance, China

## 53-953

**Prevention of materials-related distress in concrete pavements in cold regions.**

Van Dam, T., Aldrich, E., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.489-500, 14 refs.

DLC TA713.I55 1998

Concrete pavements, Concrete aggregates, Concrete admixtures, Concrete durability, Frost action, Frost resistance, Frost protection, Road maintenance

## 53-954

**Winter tenting of highway pavements.**

Kestler, M.A., Krat, A.S., Roberts, G., MP 5249, International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.501-512, 6 refs.

DLC TA713.I55 1998

Pavements, Subgrade soils, Frost resistance, Frost action, Frost heave, Salting, Cracking (fracturing), Cold weather tests, Road maintenance

It is estimated that pavements subjected to seasonal freezing have approximately 50% of the maintenance free life of pavements in non-frost areas. Non-uniform frost heaving during the winter and early spring and loss of pavement strength during thawing result in a variety of pavement distresses including cracking and rutting. In contrast to these distresses, which over the years have received considerable attention in the literature, tenting has received very little attention. Tenting consisted of localized heaving in the immediate vicinity of transverse cracks. It typically produces a highly irregular riding surface, particularly toward the end of the winter season, and can lead to rapid premature deterioration of the pavement surface. There have been unofficial estimates of as much as 10 cm of rise over a horizontal distance of approximately 3.3 m. In contrast to most frost-related distresses, tenting is not unique to low volume roads; it occurs just as frequently on highways that have been designed for high volumes of traffic and for withstanding freezing and thaw weakening. Furthermore, it is frequently exhibited by pavements that are in otherwise good condition. The distribution of salinity (from road salt) within the base course is suspected to be a primary contributor toward tenting. This paper discusses results from field and lab testing and theorizes about the causes and mechanics of tenting.

## 53-955

**Evaluation of wood chip fill on MN TH 53.**

Schrader, C., Lukanen, E., Schmidt, E., Cochran, G., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.513-523, 8 refs.

DLC TA713.I55 1998

Peat, Swamps, Embankments, Earth fills, Wood, Soil stabilization, Slope protection, Road maintenance, United States—Minnesota

## 53-956

**Deformability parameters of shredded tire light-weight fills.**

Heimdahl, T.C., Drescher, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.524-535, 9 refs.

DLC TA713.I55 1998

Embankments, Earth fills, Rubber, Soil stabilization, Road maintenance

## 53-957

**Effect of deforestation on the stability of slopes.**

Eigenbrod, K.D., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.536-547, 7 refs.

DLC TA713.I55 1998

Slope stability, Glacial deposits, Lacustrine deposits, Soil erosion, Vegetation factors, Landslides, Canada—Ontario—Nipigon

## 53-958

**Cold formed steel arches for Antarctica.**

Thulin, F.A., Jr., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.548-557, 4 refs.

DLC TA713.I55 1998

Buildings, Roofs, Steel structures, Snow loads, Wind pressure, Design criteria, Cold weather construction, Antarctica—Amundsen-Scott Station

## 53-959

**Air-formed concrete shells for cold regions.**

Quimby, T.B., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.558-567, 8 refs.

DLC TA713.I55 1998

Buildings, Roofs, Concrete structures, Concrete placing, Winter concreting, Cold weather construction

## 53-960

**End run scheduling to beat cold weather costs.**

Vasonis, G.A., Litman, J., Walker, H.C., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.568-575.

DLC TA713.I55 1998

Buildings, Concrete structures, Concrete placing, Winter concreting, Cold weather construction, Cost analysis, United States—Minnesota—Duluth

## 53-961

**Subgrade and base—some considerations in seasonally cold regions.**

Cochran, G.R., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.576-587, 42 refs.

DLC TA713.I55 1998

Pavements, Subgrade soils, Frost resistance, Frost penetration, Frost action, Thaw weakening, Frost protection, Subgrade preparation, Subgrade maintenance, Road maintenance

## 53-962

**Relating climate factors to pavement subsurface conditions.**

Ovik, J., Birgisson, B., Newcomb, D.E., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.588-599, 8 refs.

DLC TA713.I55 1998

Pavements, Subgrade soils, Soil freezing, Frost penetration, Thaw depth, Freezing indexes, Frost forecasting, Weather forecasting, Road maintenance, United States—Minnesota

## 53-963

**Temperature distribution characteristics at three LTPP seasonal monitoring sites in cold regions.**

Zhou, H.P., Rada, G., Elkins, G., Lopez, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.600-611, 4 refs.

DLC TA713.I55 1998

Pavements, Bituminous concretes, Concrete pavements, Subgrade soils, Soil temperature, Frost penetration, Thaw depth, Frost resistance, Road maintenance, United States—Minnesota, Canada—Manitoba

## 53-964

**Freeze-thaw effects on a 10% sand-bentonite mixture.**

Quiroz, J.D., Zimmie, T.F., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.612-623, 12 refs.

DLC TA713.I55 1998

Waste disposal, Earth fills, Sands, Clay soils, Frost resistance, Frost protection, Freeze thaw tests, Soil water migration, Seepage, Permeability, Waterproofing

## 53-965

**Comparative frost heave test results in Japan.**

Ono, T., Fukuda, M., Mitachi, T., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.624-635, 5 refs.

DLC TA713.I55 1998

Soil freezing, Frost heave, Frozen ground strength, Frost resistance, Soil tests, Japan

## 53-966

**Experimentally determined freeze-thaw effects on the hydraulic conductivity of geosynthetic clay liners.**

Olsta, J.T., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.636-639, 6 refs.

DLC TA713.I55 1998

Waste disposal, Earth fills, Clay soils, Geotextiles, Waterproofing, Permeability, Seepage, Frost resistance, Frost protection, Freeze thaw tests

## 53-967

**Bridge deck waterproofing membrane evaluation.**

Johnson, E., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.640-650, 2 refs.

DLC TA713.I55 1998

Bridges, Bituminous concretes, Concrete pavements, Geotextiles, Waterproofing, United States—Alaska

## 53-968

**Creating durable parking structures for the harsh Minnesota winters.**

Litman, J., Vasonis, G.A., Smith, A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.651-660.

DLC TA713.I55 1998

Buildings, Concrete structures, Concrete durability, Concrete placing, Winter concreting, Cold weather construction, United States—Minnesota—Duluth

53-969

**Computer tool for predicting the cooling of asphalt pavements.**

Voller, V.R., Newcomb, D.E., Chadborn, B., De Sombre, R., Timm, D., Luoma, J.A., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.661-671, 8 refs.

DLC TA713.I55 1998

Bituminous concretes, Concrete pavements, Concrete placing, Winter concreting, Cold weather construction, Cooling rate, Computer programs, Road maintenance

53-970

**Engineering cold regions maintenance equipment for the 21st century.**

Smithson, L.D., Smith, D.E., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.672-683, 3 refs.

DLC TA713.I55 1998

Motor vehicles, Snow removal equipment, Cold weather operation, Cost analysis, Road maintenance

53-971

**Design and operation of Single-Point Urban Interchanges in cold weather regions.**

Morrison, R.D., Williams, T.W., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.684-695, 6 refs.

DLC TA713.I55 1998

Urban planning, Highway planning, Cold weather operation, Safety, Snow removal, Road maintenance

53-972

**Snowmobile trail planning and design.**

Fields, K., Sproule, W.J., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.696-705, 6 refs.

DLC TA713.I55 1998

Snow vehicles, Snow roads, Safety, Environmental protection

53-973

**Autoclaved water permeability test.**

Li, Z.J., Chau, C.K., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.706-709, 3 refs.

DLC TA713.I55 1998

Concrete durability, Permeability, Moisture detection, Moisture meters, Waterproofing

53-974

**Arctic grout performance evaluations.**

Miltnerberger, M.A., Gulyas, R.J., Sprouts, S., Coverdale, R.T., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.710-720, 3 refs.

DLC TA713.I55 1998

Concrete piles, Grouting, Permafrost beneath structures, Permafrost control, Frozen ground strength, Frozen ground compression, Frost protection, Pile load tests, Cold weather construction, Canada—Northwest Territories—Yellowknife

53-975

**How to make concrete that will be immune to the effects of freezing and thawing.**

Mather, B., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.721-730, 34 refs.

DLC TA713.I55 1998

Concrete freezing, Concrete strength, Concrete durability, Concrete aggregates, Concrete curing, Air entrainment, Winter concreting, Frost resistance, Frost protection, Cold weather construction

53-976

**Software to establish seasonal load limits for flexible pavements.**

Bosscher, P.J., Jong, D.T., Benson, C.H., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.731-747, 14 refs.

DLC TA713.I55 1998

Pavements, Subgrade soils, Soil freezing, Frost penetration, Thaw depth, Frost forecasting, Trafficability, Highway planning, Road maintenance, Computer programs

53-977

**Reconstruction of St. Louis CSAH 48-LaVague Road near Duluth, Minnesota.**

Ulring, J.D., Lyytinen, K.A., Krzewinski, T.G., International Conference on Cold Regions Engineering, 9th, Duluth, MN, Sep. 27-30, 1998. Proceedings. Cold regions impact on civil works. Edited by D.E. Newcomb, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.748-760.

DLC TA713.I55 1998

Pavements, Frost action, Roadbeds, Embankments, Earth fills, Swamps, Geotextiles, Frost protection, Waterproofing, Soil stabilization, Road maintenance, United States—Minnesota—Duluth

53-978

**Does clast size influence fabric strength?**

Kjaer, K.H., Krüger, J., *Journal of sedimentary research A*, Sep. 1998, 68(5), p.746-749, 29 refs.

Frozen rock strength, Subglacial observations, Glacial deposits, Glacial till, Denmark, Iceland

53-979

**Modern nearshore cold-temperate calcareous sediments in the Troms District, northern Norway.**

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Coastal topographic features, Sediments, Sediment transport, Ecology, Algae, Acclimatization, Solar radiation, Oceanography, Hydrography, Air temperature, Marine deposits, Climatic factors, Gravel, Sands, Norway

53-980

**Comparing sea-ice sediment load with Beaufort Sea shelf deposits: is entrainment selective.**

Reimnitz, E., McCormick, M., Bischof, J., Darby, D.A., *Journal of sedimentary research A*, Sep. 1998, 68(5), p.777-787, Refs. p.786.

Marine deposits, Sediment transport, Sea ice, Ice rafting, Ice composition, Ice, Impurities, Chemical analysis, Minerals, Lithology, Sands

53-981

**Origin of the fabric of laminated fine-grained glaciolacustrine deposits.**

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Glacial deposits, Lacustrine deposits, Pleistocene, Clays, Experimentation, Laminar flow, Fossils, Microstructure, Structural analysis, United States—New York

53-982

**Frolikh Fan: a large Pleistocene glaciolacustrine outwash fan in northern Lake Baikal, Siberia.**

Back, S., De Batist, M., Kirillov, P., Strecker, M.R., Vanhauwaert, P., *Journal of sedimentary research A*, Sep. 1998, 68(5), p.841-849, Refs. p.848-849.

Glacial deposits, Lacustrine deposits, Glaciation, Pleistocene, Bottom topography, Glacial lakes, Seismic surveys, Moraines, Glacier surges, Glacial geology, Geomorphology, Outwash, Russia—Baykal, Lake

53-983

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Ice loads, Icebreakers, Strain measuring instruments, Propellers, Experimentation, Strain tests, Optical properties

53-985

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Marine biology, Biomass, Physical properties, Ecology, Plankton, Underwater acoustics, Sound waves, Backscattering, Indexes (ratios), Detection, Simulation

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Limnology, Subpolar regions, Lacustrine deposits, Water pollution, Sedimentation, Hydrocarbons, Hydrogeochemistry, Waste treatment, Water treatment, Environmental impact, Finland

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Air pollution, Subpolar regions, Aerosols, Organic nuclei, Plant ecology, Trees (plants), Plant tissues, Distribution, Environmental tests, Chemical analysis, Correlation, Origin, Canada—Northwest Territories—Ellesmere Island

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Snow accumulation, Snow cover distribution, Snow depth, Snowfall, Snow air interface, Seasonal variations, Climatic factors, Meteorological data, Weather stations, Statistical analysis, Slovakia

## 53-999

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## 53-1000

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## 53-1001

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Oceanography, Subpolar regions, Ocean currents, Hydrography, Salinity, Brines, Convection, Turbulent diffusion, Stratification, Water transport, Profiles, Arctic Ocean, Norwegian Sea, Greenland Sea, Russia—Kara Sea

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Oceanography, Subpolar regions, Ocean currents, Convection, Salinity, Hydrography, Seasonal variations, Wind factors, Air water interactions, Greenland Sea, Iceland Sea

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Oceanography, Subpolar regions, Ocean currents, Water balance, Water transport, Air water interactions, Seasonal variations, Barents Sea

## 53-1006

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Oceanography, Subpolar regions, Water pollution, Bottom sediment, Biomass, Ecosystems, Hydrocarbons, Environmental tests, Drill core analysis, Sampling, Statistical analysis, Barents Sea

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Oceanography, Subpolar regions, Water pollution, Bottom sediment, Radioactivity, Sedimentation, Distribution, Biomass, Radioactive isotopes, Drill core analysis, Environmental tests, Barents Sea

## 53-1008

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Oceanography, Subpolar regions, Marine biology, Oceanographic surveys, Ice edge, Biomass, Chlorophylls, Ecosystems, Distribution, Ice cover effect, Nutrient cycle, Seasonal variations, Barents Sea

53-1009

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53-1010

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53-1011

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53-1012

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53-1013

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53-1014

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53-1015

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53-1016

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DLC GB400.2.G448 1996

Pleistocene, Geomorphology, Landforms, Landscape development, Glacial hydrology, Bedrock, Ice sheets, Glacial lakes, Lake bursts, Subglacial drainage, Meltwater, Water erosion, Models, Canada

53-1017

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DLC GB651.16

Spaceborne photography, Snow surveys, Snow cover distribution, Snow hydrology, Grain size, Wet snow, Albedo, Sensor mapping, Snow water equivalent

53-1018

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Ground water, Petroleum products, Hydrocarbons, Waste disposal, Water pollution, Oil spills, Soil pollution, Soil tests, Soil chemistry, Land reclamation, Health, United States—New Hampshire

53-1019

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Buildings, Roofs, Snow removal, Ice prevention, Protective coatings, Polymers

53-1020

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Power line icing, Snow loads, Snow water content, Moisture meters, Moisture detection, Snow optics, Infrared equipment

53-1021

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Motor vehicles, Cooling systems, Frost protection, Ice prevention, Protective coatings

53-1022

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Sea ice, Loads (forces), Ships, Propellers, Models, Ice loads, Metal ice friction, Ice navigation, Ice cutting

53-1023

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Roads, Safety, Low temperature research, Ice formation, Road icing, Ice forecasting, Frost forecasting, Weather forecasting, Road maintenance, Italy

53-1024

Remote sensing and GIS studies in northeast Greenland. [Fernerkundungs- und GIS-Studien in Nordostgrönland]

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Ice sheets, Glaciers, Ablation, Computer applications, Glacier surveys, Glacier oscillation, Glacier mass balance, Greenland

53-1025

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Low temperature tests, Chemical properties, Structural analysis, Crystals

53-1026

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DLC GB400.42.M3 L36 1998

Landforms, Geomorphology, Mapping, Airborne radar, Synthetic aperture radar, Image processing, Glacier surfaces, Mathematical models, Imaging, Remote sensing, Photointerpretation, Topographic surveys, Terrain identification

53-1027

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DLC GB400.42.M3 L36 1998

Aerial surveys, Placer mining, Gold, Geomorphology, Landforms, Mapping, Image processing, Channels (waterways), Flooding, Spaceborne photography, Soil erosion, Water erosion, United States—Alaska

53-1028

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DLC GB400.42.M3 L36 1998

Glacier mass balance, Glacier flow, Glacier oscillation, Glacier surfaces, Image processing, Mapping, Ablation, Velocity measurement, Computerized simulation, Switzerland—Haut Glacier d'Arolla

53-1029

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DLC GB400.42.M3 L36 1998

Mountain glaciers, Alpine landscapes, Glacier melting, Meltwater, Snow line, Ice models, LANDSAT, Image processing, Runoff forecasting, Topographic surveys, Analysis (mathematics), Switzerland



## 53-1030

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Mountain glaciers, Alpine landscapes, Terrain identification, Snow cover, Computerized simulation, Snow water equivalent, Snow surveys, Snow depth, Geomorphology, Glacier surfaces, Topographic surveys, Switzerland—Haut Glacier d'Arolla

## 53-1031

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Cold weather construction, Design criteria, Heating, Ventilation, Air conditioning, Indoor climates, Air pollution, Impurities, Warning systems, Antarctica—Amundsen-Scott Station

## 53-1032

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DLC G593.M54 1997

Low temperature research, Research projects, Organizations, Bibliographies, Manuals, Data processing, Data transmission

## 53-1033

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Remote sensing, Image processing, Computer applications, Data processing, Performance, Antarctica

## 53-1034

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Pleistocene, Glacial geology, Glaciation, Moraines, Lacustrine deposits, Drill core analysis, Geochronology, Radioactive age determination, Correlation, Canada—Northwest Territories—Baffin Island

## 53-1035

IUE's detection of tenuous SO<sub>2</sub> frost on Ganymede and its rapid time variability.

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Extraterrestrial ice, Satellites (natural), Surface properties, Ice detection, Frost, Radiation absorption, Ultraviolet radiation, Photometry, Spectra

## 53-1036

Multiwavelength lidar aerosol measurements made at Eureka (80°N,86°W) during early 1995.

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Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Particle size distribution, Lidar, Backscattering, Statistical analysis, Seasonal variations, Canada—Northwest Territories—Eureka

## 53-1037

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## 53-1038

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Glacier oscillation, Ice sheets, Glacier flow, Grounded ice, Ice mechanics, Ice temperature, Ice solid interface, Ice models, Thermodynamics, Simulation, Antarctica—Siple Coast

## 53-1039

Accuracy of satellite radar altimeter data over the Greenland ice sheet determined from airborne laser data.

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Remote sensing, Glacier surveys, Ice sheets, Height finding, Geodetic surveys, Lasers, Radio echo soundings, Spacecraft, Accuracy, Correlation, Topographic effects, Greenland

## 53-1040

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Pleistocene, Isostasy, Orientation, Geologic structures, Thickness, Sea level, Ice loads, Rheology, Models

## 53-1041

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Mars (planet), Regolith, Geocryology, Rock properties, Frozen rock temperature, Frost shattering, Weathering, Geochemistry, Photointerpretation, Models

## 53-1042

Europa's surface composition and sputter-produced ionosphere.

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Satellites (natural), Atmospheric physics, Magnetic properties, Extraterrestrial ice, Regolith, Ice physics, Decomposition, Ionization, Spectroscopy

## 53-1043

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Polar atmospheres, Gravity waves, Radar echoes, Atmospheric circulation, Wind velocity, Shear flow, Turbulent flow, Diurnal variations, Sweden—Esrang

## 53-1044

Forty year record of mercury in central Greenland snow.

Boutron, C.F., Vandal, G.M., Fitzgerald, W.F., Ferrari, C.P., *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3315-3318, 23 refs.

Climatology, Polar atmospheres, Air pollution, Aerosols, Metals, Sedimentation, Ice sheets, Age determination, Snow composition, Chemical analysis, Sampling, Seasonal variations, Environmental tests, Greenland

## 53-1045

Ground based millimeter-wave observations of arctic ozone depletion during winter and spring of 1996/97.

Sinnhuber, B.M., Langer, J., Klein, U., Raffalski, U., Künzi, K., Schrems, O., *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3327-3330, 20 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Degradation, Photochemical reactions, Aerosols, Ozone, Turbulent diffusion, Radiometry, Seasonal variations, Norway—Spitsbergen

## 53-1046

Ground based millimeter-wave observations of arctic chlorine activation during winter and spring 1996/97.

Raffalski, U., et al, *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3331-3334, 15 refs.

Climatology, Polar atmospheres, Ozone, Stratosphere, Degradation, Turbulent diffusion, Photochemical reactions, Models, Radiometry, Profiles, Diurnal variations, Norway—Spitsbergen

## 53-1047

Quasi-biennial modulation of the southern hemisphere stratospheric polar vortex.

Baldwin, M.P., Dunkerton, T.J., *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3343-3346, 21 refs.

Climatology, Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric pressure, Oscillations, Wind direction, Climatic factors, Statistical analysis

## 53-1048

Sea ice transport: a highly variable link between Arctic and North Atlantic.

Hilmer, M., Harder, M., Lemke, P., *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3359-3362, 11 refs.

Oceanography, Sea ice distribution, Freezing rate, Drift, Ice volume, Atmospheric pressure, Air ice water interaction, Seasonal variations, Thermodynamics, Simulation, Arctic Ocean, Atlantic Ocean

## 53-1049

Ice age storm trajectories inferred from radar stratigraphy at Taylor Dome, Antarctica.

Morse, D.L., Waddington, E.D., Steig, E.J., *Geophysical research letters*, Sep. 1, 1998, 25(17), p.3383-3386, 24 refs.

Pleistocene, Paleoclimatology, Storms, Wind direction, Synoptic meteorology, Ice sheets, Ice cover effect, Ice cores, Ice accretion, Stratigraphy, Radar echoes, Antarctica—Taylor Dome

## 53-1050

Initial results from a distributed, physically based model of glacial hydrology.

Arnold, N., Richards, K., Willis, I., Sharp, M., *Hydrological processes*, Feb. 1998, 12(2), p.191-219, 31 refs.

Glacial hydrology, Glacier mass balance, Glacier melting, Thawing rate, Subglacial drainage, Heat balance, Surface energy, Surface drainage, Hydrography, Boreholes, Mathematical models, Switzerland—Valais

## 53-1051

Stream flow characterization and feature detection using a discrete wavelet transform.

Smith, L.C., Turcotte, D.L., Isacks, B.L., *Hydrological processes*, Feb. 1998, 12(2), p.233-249, 45 refs.

River basins, Stream flow, Hydrography, Glacial hydrology, Snow hydrology, Snowmelt, Spectra, Oscillations, Statistical analysis, Mathematical models, Seasonal variations, Canada—British Columbia—Forrest Kerr Creek, United States—Maine—Ammonoosuc River



53-1052

Uniform versus an aggregated water balance of a semi-arid watershed.

Fierchinger, G.N., Cooley, K.R., Hanson, C.L., Seyfried, M.S., *Hydrological processes*, Feb. 1998, 12(2), p.331-342, 35 refs.

Watersheds, Hydrography, Water balance, Precipitation (meteorology), Evapotranspiration, Snow hydrology, Snow accumulation, Snowmelt, Vegetation factors, Forecasting, Seasonal variations, United States—Idaho—Upper Sheep Creek

53-1053

Evaluation of image-type glide slope performance in the presence of snow cover.

Marcum, F., *IEEE transactions on aerospace and electronics systems*, Jan. 1998, 34(1), p.71-82, 26 refs.

Aircraft, Aircraft landing areas, Navigation, Orientation, Antennas, Wave propagation, Reflectivity, Snow optics, Snow depth, Dielectric properties, Imaging, Monitors, Snow cover effect, Analysis (mathematics)

53-1054

Heat media and heat-medium circulation systems.

Imanari, M., Yanatori, M., Hiramatsu, M., Kasuga, T., *Japan Patent Office. Patent*, July 29, 1997, n.p., No.97194817.

Snow melting, Artificial melting, Electric heating, Heat transfer

53-1055

Manufacture of calcium magnesium acetate agents from dolomite for melting snow.

Sagami, K., *Japan Patent Office. Patent*, Oct. 15, 1996, n.p., No.96269438.

Chemical ice prevention, Artificial melting, Snow removal, Liming

53-1056

Polyester acrylate urethane compositions for freezing control materials and freezing control structure and pavement prepared from the compositions.

Tsuji, S., Mita, T., Ikeda, M., Yasumura, T., Fukakusa, K., *Japan Patent Office. Patent*, Oct. 15, 1996, n.p., No.96269432.

Road icing, Pavements, Chemical ice prevention, Protective coatings, Frost protection, Road maintenance

53-1057

Manufacture of solid calcium chloride ice- and snow-melting agents for roads.

Ueda, Y., et al., *Japan Patent Office. Patent*, Sep. 17, 1996, n.p., No.96239647.

Road icing, Chemical ice prevention, Salting, Artificial melting, Ice removal, Snow removal, Road maintenance

53-1058

Sheets with prevention of ice and snow adhesion.

Myoshi, T., Nakanishi, T., *Japan Patent Office. Patent*, June 13, 1995, n.p., No.95148879.

Ice adhesion, Ice prevention, Protective coatings, Plastics

53-1059

Deicing agent containing thickeners.

Pech, V., *World Intellectual Property Organization. Patent Cooperation Treaty. Patent*, Mar. 12, 1998, n.p., No.9810032.

Chemical ice prevention, Ice removal

53-1060

Ice- and snow-melting compositions containing salt, calcium magnesium acetate, and sodium silicate and their manufacture.

Simper, J.L., *World Intellectual Property Organization. Patent Cooperation Treaty. Patent*, Dec. 10, 1992, n.p., No.9221732, For a patent with the same author, number, and date but with a different title, see 49-3566.

Chemical ice prevention, Salting, Artificial melting, Snow removal, Ice removal, Road maintenance

53-1061

Method and apparatus for forming ice particles from water, and use of the ice particles.

Reichel, D., Iff, P., Stobrawe, H., *Germany Patent Office. Patent*, Apr. 30, 1998, n.p., No.19731052. Liquefied gases, Spray freezing, Artificial ice, Ice (construction material), Cellular concretes, Air entrainment

53-1062

Process for melting snow and/or ice on pavements and roads with an alkali metal carboxylate.

Poellmann, K., Stankowiak, A., Kapfinger, J., *Germany Patent Office. Patent*, Jan. 5, 1994, n.p., No.4221661, For a patent with the same authors, number, and date but with a different title, see 49-261.

Road icing, Chemical ice prevention, Artificial melting, Ice removal, Snow removal, Road maintenance

53-1063

Method for determination of the composition of a liquid on the surface of a structure.

Larue, F., *France Patent Office. Patent*, Mar. 6, 1998, n.p., No.2752939.

Aircraft icing, Ice acoustics, Ice detection, Acoustic measurement, Ultrasonic tests

53-1064

Snow-removing ice-thawing agents.

Liu, X.G., Zhang, Z.G., Yu, X.Z., *China Patent Office. Patent*, June 26, 1996, n.p., No.1125247. Chemical ice prevention, Salting, Snow removal, Ice removal

53-1065

Subsea piping method and plant.

Christensen, J.S., Cotton, J.L., Stinessen, K.O., *United Kingdom Patent Office. Patent*, Oct. 28, 1992, n.p., No.2255102.

Underground pipelines, Ocean bottom, Pipe laying, Pipeline freezing, Frost protection, Ice prevention

53-1066

De-icing and anti-freezing composition.

Kraljevic, G., *Canada Patent Office. Patent*, Feb. 23, 1996, n.p., No.2130649.

Chemical ice prevention, Antifreezes, Ice removal

53-1067

Fresh-water plankton in a pond at Cape Adare. [Nankyoku no ike 100 nen zen to onaji purankuton ga ikite ita]

Fukushima, H., *Polar news*, Feb. 1997, No.64, p.15-19, In Japanese.

Ponds, Lake water, Ecosystems, Plankton, Algae, Microbiology, Plant ecology, Antarctica—Adare, Cape

53-1068

Deep ice coring at Dome Fuji Station. [Domu Fuji kyoten ni okeru hyosho shinso kussaku]

Fujii, Y., *Polar news*, Aug. 1997, No.65, p.8-12, In Japanese.

Ice cores, Ice coring drills, Drilling, Coring, Antarctica—Dome Fuji Station

53-1069

Enactment of the antarctic environment protection laws of Japan. [Nankyoku kankyo hogoho seitei ni tsuite]

Hoshino, K., Ono, T., *Polar news*, Aug. 1997, No.65, p.60-64, In Japanese.

Environmental protection, Legislation, International cooperation, Japan, Antarctica

53-1070

Recent studies on ozone hole and CFCs. [Ozon horu to furon no saikin no kenkyu]

Watanuki, K., *Polar news*, Mar. 1998, No.66, p.5-9, In Japanese. 5 refs.

Polar atmospheres, Atmospheric composition, Air pollution, Ozone

53-1071

Neural network algorithm for sea ice edge classification.

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DLC QA76.87.A656 1997

Sea ice, Ice edge, Mathematical models, Computerized simulation, Oceanographic surveys, Meteorological data, Mapping, Airborne radar, Antarctica

53-1072

Hot spots in cold adaptation: localized increases in conformational flexibility in lactate dehydrogenase A<sub>4</sub> orthologs of antarctic notothenioid fishes.

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Acclimatization, Marine biology, Physiological effects, Low temperature research, Temperature measurement, Antarctica

53-1073

Correlations of stratospheric abundances of CH<sub>4</sub> and N<sub>2</sub>O derived from ATMOS measurements.

Michelsen, H.A., Manney, G.L., Gunson, M.R., Rinsland, C.P., Zander, R., *Geophysical research letters*, Aug. 1, 1998, 25(15), p.2777-2780, 23 refs.

Climatology, Atmospheric composition, Stratosphere, Polar atmospheres, Aerosols, Photochemical reactions, Turbulent diffusion, Indexes (ratios), Statistical analysis, Spectroscopy, Correlation

53-1074

Ultrafine aerosols particles in aircraft plumes: in situ observations.

Schröder, F.P., et al., *Geophysical research letters*, Aug. 1, 1998, 25(15), p.2789-2792, 20 refs.

Climatology, Condensation trails, Aerosols, Air pollution, Particle size distribution, Condensation nuclei, Scavenging, Heterogeneous nucleation, Ice formation, Chemical properties, Sampling

53-1075

Lidar observations of gravity wave activity and arctic stratospheric vortex core warming.

Duck, T.J., Whiteway, J.A., Carswell, A.L., *Geophysical research letters*, Aug. 1, 1998, 25(15), p.2813-2816, 23 refs.

Climatology, Polar atmospheres, Stratosphere, Air masses, Air temperature, Temperature variations, Wind velocity, Gravity waves, Lidar, Seasonal variations, Canada—Northwest Territories—Eureka

53-1076

Noctilucent clouds and wave dynamics: observations at Sondrestrom, Greenland.

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Climatology, Polar atmospheres, Stratosphere, Gravity waves, Cloud cover, Cloud physics, Lidar, Backscattering, Greenland

53-1077

Acid ions at triple junction of antarctic ice observed by Raman scattering.

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Climatology, Ice sheets, Ice cores, Ice composition, Impurities, Aerosols, Solutions, Electrical resistivity, Ice crystal structure, Ice spectroscopy, Spectra, Ions, Antarctica—Nansen Ice Sheet

53-1078

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Seismology, Tectonics, Subpolar regions, Earth crust, Structural analysis, Seismic reflection, Wave propagation, Velocity measurement, Statistical analysis, Models, Russia—Siberia

## 53-1079

**Overtone spectra and hydrogen potential of H<sub>2</sub>O at high pressure.**

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Ice physics, High pressure ice, Deuterium oxide ice, Vibration, Phase transformations, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice spectroscopy, Radiation absorption, Infrared spectroscopy, Spectra, Models

## 53-1080

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Water treatment, Waste treatment, Cooling systems, Refrigeration, Heat recovery, Solutions, Ice water interface, Freezing points, Desalting, Ice crystal growth, Design

## 53-1081

**Simplified numerical model for melting of ice with natural convection.**

Kahraman, R., Zughbi, H.D., Al-Nassar, Y.N., Hastoaglu, M.A., Sobh, N., *International communications in heat and mass transfer*, Apr. 1998, 25(3), p.359-368, 19 refs.

Ice physics, Ice melting, Phase transformations, Ice solid interface, Liquid phases, Heat transfer coefficient, Convection, Ice heat flux, Ice temperature, Profiles, Mathematical models

## 53-1082

**Ice-induced non-linear vibration of an offshore platform.**

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Offshore structures, Pile structures, Ice solid interface, Deformation, Vibration, Ice loads, Dynamic loads, Velocity measurement, Resonance, Mathematical models, Classifications

## 53-1083

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Cryobiology, Ice physics, Preserving, Damage, Simulation, Spheres, Solidification, Ice water interface, Thermal expansion, Thermal stresses, Phase transformations, Mathematical models

## 53-1084

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Road icing, Ice forecasting, Surface temperature, Weather stations, Data processing, Simulation, Mathematical models, Statistical analysis, Accuracy

## 53-1085

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Polymers, Freeze drying, Aggregates, Scanning electron microscopy, Nuclear magnetic resonance, Low temperature tests, Elastic properties, Spectra

## 53-1086

**Short-term thermal performance of a built-in solar storage for frost prevention in a greenhouse.**

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Heat recovery, Buildings, Agriculture, Solar radiation, Radiation absorption, Greenhouse effect, Frost, Ice prevention, Air temperature, Temperature control

## 53-1087

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Sea ice, Sea ice distribution, Ice cover thickness, Data processing, Computer programs

## 53-1088

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Core samplers, Pleistocene, Glacial geology, Lacustrine deposits, Radioactive age determination, Magnetic properties, Paleogeology, Models, Remanent magnetism, Argentina

## 53-1089

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## 53-1090

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DLC TF855.158 1998

Ultrasonic tests, Sensors, Safety, Accidents, Railroads, Snow cover effect, Snow survey tools

## 53-1091

**Digital elevation data, Landsat TM and magnetic data for visualization of geomorphological and geological features.**

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DLC TA705.R393 1996

Image processing, Geomorphology, Geology, Altitude, LANDSAT, Magnetic surveys, Site surveys, Topographic surveys, Scandinavia

## 53-1092

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DLC TA705.R393 1996

Image processing, Data transmission, Alpine landscapes, Snow cover, Snowmelt, Runoff forecasting, Snow water content, Simulation, Climatic factors, Remote sensing, Snow hydrology

## 53-1093

**Raman-DIAL measurements in the upper troposphere and stratosphere: the effect of high-altitude ice clouds on ozone.**

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DLC QC871.064 1997

Climatology, Stratosphere, Cloud physics, Remote sensing, Ozone, Ice detection, Ice crystal optics, Lidar, Scattering, Polarization (waves), Radiance

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**Unreasonable effectiveness of mimicking measured infrared extinction by hexagonal ice crystals with Mie ice spheres.**

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Climatology, Cloud physics, Remote sensing, Radiometry, Radiance, Ice crystal optics, Attenuation, Simulation, Accuracy

## 53-1095

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Geological surveys, Subpolar regions, Earth crust, Tectonics, Fracture zones, Hydrocarbons, Migration, Natural resources, Mineralogy, Geothermy, Russia—Franz Josef Land

## 53-1096

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Cosmic dust, Extraterrestrial ice, Ice detection, Ice composition, Spectroscopy, Radiation absorption, Hydrocarbons, Spectra, Simulation, Correlation

## 53-1097

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Cosmic dust, Extraterrestrial ice, Spectroscopy, Ice detection, Radiation absorption, Ice composition, Carbon dioxide, Chemical composition, Spectra

## 53-1098

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Cryobiology, Ice physics, Phase transformations, Antifreezes, Life (durability), Biomass, Preserving, Viability, Theories

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**Chrome-spinels in gabbro-wehrlite intrusions of the Pechenga area, Kola Peninsula, Russia: emphasis on alteration features.**

Abzalov, M.Z., *Lithos*, July 1998, 43(3), p.109-134, 52 refs.

Earth crust, Subpolar regions, Mineralogy, Magma, Sedimentation, Geologic processes, Geochemistry, Sampling, Statistical analysis, Chemical analysis, Russia—Kola Peninsula

## 53-1100

**Empirical heat transfer and frost thickness correlations during frost deposition on a cylinder in cross-flow in the transient regime.**

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Pipes (tubes), Frost, Ice accretion, Ice cover thickness, Ice air interface, Mass transfer, Heat transfer coefficient, Air flow, Wind tunnels, Analysis (mathematics), Statistical analysis, Correlation

53-1101

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Sea ice, Ice floes, Aerial surveys, Spaceborne photography, Sensor mapping, Ice surface, Meltwater, Ponds, Distribution, Radiometry, Brightness, Snow optics, Sensor mapping, Arctic Ocean

53-1102

Mid-tropospheric circulation and surface melt on the Greenland ice sheet. Part I: atmospheric teleconnections.

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Climatology, Atmospheric circulation, Ice air interface, Ice sheets, Glacier melting, Topographic surveys, Radiometry, Statistical analysis, Seasonal variations, Correlation, Greenland

53-1103

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Climatology, Atmospheric circulation, Atmospheric pressure, Wind direction, Ice sheets, Glacier melting, Glacier surfaces, Topographic effects, Ice air interface, Statistical analysis, Classifications, Greenland

53-1104

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Image processing, Weather stations, Weather forecasting, Aircraft icing, Meteorological data, Data processing, Ice forecasting, Computer programs

53-1105

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Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Computerized simulation

53-1106

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53-1107

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Glacier surveys, Ice sheets, Ice shelves, Glacier oscillation, Glacier flow, Glacier tongues, Topographic surveys, Mapping, Spaceborne photography, Global warming, Antarctica

53-1108

Growth of three species of *Bibio* (Diptera, Bibionidae) larvae under alpine conditions in Norway.

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Soil tests, Meadow soils, Alpine landscapes, Mountain soils, Biomass, Growth, Ecology, Ecosystems, Sampling, Statistical analysis, Norway

53-1109

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DLC TA440.C6243 1996

Concrete structures, Concrete durability, Marine atmospheres, Concrete aggregates, Air entrainment, Water cement ratio, Cold weather performance, Freeze thaw tests, Frost resistance, Standards, United States—Maine—Treat Island

53-1110

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DLC TA440.C6243 1996

Concrete aggregates, Concrete durability, Marine atmospheres, Frost resistance, Freeze thaw cycles, Damage, Ion diffusion, Chemical composition, Cold weather tests, Cold weather performance

53-1111

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Concrete admixtures, Concrete structures, Concrete durability, Compressive properties, Marine atmospheres, Freeze thaw tests, Frost resistance, Salting, Degradation, Porosity, Mechanical tests

53-1112

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DLC TJ260.P76424 1997 Vol 3

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53-1118

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## 53-1126

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## 53-1127

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## 53-1130

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Paleoclimatology, Geocryology, Periglacial processes, Taiga, Permafrost weathering, Minerals, Freeze thaw cycles, Frozen ground temperature, Glacial deposits, Russia—Yakutia

## 53-1131

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## 53-1132

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Geocryology, Glaciation, Models, Paleoclimatology, Pleistocene, Bottom sediment, Marine geology

## 53-1133

**Reconstruction of paleogeographic conditions on the Laptev Sea shelf for Late Pleistocene-Holocene glaciostatic cycle. [Rekonstruktsiia paleogeograficheskikh uslovii shel'fa moria Laptevskh dlia pozdnepleistotsen-golotsenovogo glatsioevstaticheskogo tsikla]**

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## 53-1134

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Active layer, Thawing rate, Slope processes, Geocryology, Cryogenic structures, Landslides, Thaw depth

## 53-1135

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## 53-1137

**Yeasts in Late Pliocene-Early Pleistocene Siberian permafrost. [Drozhzhi v vechnomerzlykh otlozheniakh Sibiri pozdnepliototsenovogo-rannepleistotsenovogo vozrasta]**

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53-1138

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Algae, Soil microbiology, Permafrost, Bacteria, Chlorophylls, Photosynthesis, Cryobiology, Sediments, Russia—Kolyma

53-1139

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53-1140

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53-1141

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53-1142

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53-1143

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53-1144

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Radio echo soundings, Rheology, Basal sliding, Glacier flow, Ice models, Flow measurement, Antarctica—West Antarctica

53-1145

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53-1146

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Spaceborne photography, Radar echoes, Glacier flow, Stream flow, Ice cover thickness, Seismic reflection, Basal sliding, Mapping, Glacier thickness, Antarctica—West Antarctica

53-1147

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Glacier flow, Flow rate, Seismic surveys, Stream flow, Meltwater, Stresses, Icequakes, Antarctica—West Antarctica

53-1148

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Radioactive age determination, Glacial deposits, Moraines, Glacier surfaces, Glacial geology, Geochronology, Antarctica—Transantarctic Mountains

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53-1150

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Ice cores, Glacial deposits, Algae, Wind factors, Paleoclimatology, Atmospheric circulation, Radioactive age determination, Snow stratigraphy, Meltwater, Antarctica—Taylor Dome

53-1151

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Boreholes, Temperature measurement, Paleoclimatology, Strains, Climatic changes, Antarctica—McMurdo Dry Valleys

53-1152

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53-1153

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Glacier surfaces, Spaceborne photography, Topographic surveys, Image processing, Glacier oscillation, Antarctica—Mertz Glacier Tongue, Antarctica—Ninnis Glacier Tongue

53-1154

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Ice shelves, Ice surface, Topographic surveys, Spaceborne photography, Glaciers, Photointerpretation, Seismic surveys, Crevasse, Strains, Antarctica—McMurdo Ice Shelf

53-1155

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Glaciation, Glacier oscillation, Radioactive age determination, Sea level, Paleoclimatology, Ice water interface, Ice sheets, Meltwater, Glacial geology, Fossils, Sea ice distribution, Antarctica—Ross Sea

53-1156

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53-1157

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Core samplers, Paleoclimatology, Microbiology, Permafrost samplers, Glacial geology, Fossils, Glacial deposits, Ice cores, Antarctica—McMurdo Dry Valleys

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Seismic surveys, Ice sheets, Glacier mass balance, Topographic surveys, Velocity measurement, Mapping, Antarctica—South Pole

53-1159

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Marine deposits, Sediments, Core samplers, Glacial geology, Ice sheets, Sea ice distribution, Radioactive age determination, Paleoclimatology, Glacier oscillation, Antarctica—Ross Sea

53-1160

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Oceanographic surveys, Water temperature, Hydrothermal processes, Water chemistry, Hydrography, Data processing, Antarctica—Bransfield Strait

53-1161

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Marine deposits, Lacustrine deposits, Chemical analysis, Core samplers, Paleoclimatology, Paleobotany, Antarctica

53-1162

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Oceanographic surveys, Water chemistry, Marine deposits, Chemical analysis, Glacial geology, Simulation, Glacial till, Antarctica—Ross Sea

## 53-1163

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Sea ice, Ice salinity, Ice cores, Core samplers, South Pacific Ocean

## 53-1164

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Oceanographic surveys, Sea water, Salinity, Ocean bottom, Water chemistry, Water temperature, Antarctica—Weddell Sea

## 53-1165

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## 53-1166

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Marine biology, Biomass, Seasonal variations, Oceanographic surveys, Photosynthesis, Light transmission, Sea water, Solar radiation, Cloud cover, Antarctica

## 53-1167

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Radioactive age determination, Marine biology, Fossils, Paleoclimatology, Water chemistry, Sea water, Geochemistry

## 53-1168

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## 53-1169

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Climatology, Marine atmospheres, Turbulent boundary layer, Subpolar regions, Fluid dynamics, Wind direction, Wind velocity, Atmospheric pressure, Sounding, Topographic effects, Models, Seasonal variations, United States—Alaska—Shelikof Strait

## 53-1170

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Climatology, Air masses, Plains, Air temperature, Surface temperature, Heat balance, Snow cover distribution, Snow air interface, Snow cover effect, Statistical analysis, Mathematical models, Weather forecasting, United States—Great Plains

## 53-1171

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Climatology, Synoptic meteorology, Atmospheric boundary layer, Lake effects, Cloud cover, Surface temperature, Moisture transfer, Heat flux, Static stability, Air water interactions, Snowstorms, Weather forecasting, Statistical analysis, United States—Michigan—Michigan, Lake

## 53-1172

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Climatology, Precipitation (meteorology), Weather forecasting, Snowstorms, Accuracy, United States

## 53-1173

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53-1198

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53-1206

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## 53-1207

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Research projects, Low temperature research, Polar regions, Antarctica

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Atmospheric physics, Gravity waves, Radar, Atmospheric composition, Atmospheric circulation, Geomagnetism, Polar atmospheres, Antarctica—Showa Station

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Geophysical surveys, Solar radiation, Ultraviolet radiation, Thermal analysis, Atmospheric physics, Atmospheric composition, Atmospheric disturbances, Magnetic surveys, Atmospheric electricity, Polar atmospheres, Antarctica—South Pole

## 53-1221

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Polar atmospheres, Stratosphere, Ozone, Periodic variations, Seasonal variations, Aerosols, Air pollution, Antarctica

## 53-1222

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Ozone, Polar atmospheres, Atmospheric composition, Seasonal variations, Air masses, Antarctica—Neumayer Station

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Ozone, Atmospheric composition, Air pollution, Ultraviolet radiation, Measuring instruments, Environmental impact, Physiological effects, Polar atmospheres

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Ultraviolet radiation, Polar stratospheric clouds, Environmental impact, Physiological effects, Surface properties, Ozone, Atmospheric composition, Clouds (meteorology), Low temperature research, Data processing, Snow surface, Reflection, Antarctica

## 53-1225

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Snow composition, Seasonal variations, Chemical analysis, Brines, Snow impurities, Aerosols, Antarctica—Asuka Station

## 53-1226

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Classifications, Image processing, Spaceborne photography, Clouds (meteorology), Sea ice, Snow surface, Ice surface, Radiation, Models, Polar regions, Antarctica

53-1227

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Atmospheric composition, Air pollution, Bubbles, Polar regions, Variations, Carbon dioxide, Ice cores, Climatic changes, Paleoclimatology, Glacial meteorology, Antarctica

53-1228

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Oceanographic surveys, Ecology, Marine biology, Ecosystems, Research projects, Climatic changes, Pollution, Ozone, Environmental impact, Antarctica

53-1229

Temporal changes in marine environments in the Antarctic Peninsula area during the 1994/95 austral summer.

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53-1230

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Marine biology, Oceanographic surveys, Plankton, Biomass, Periodic variations, Air ice water interaction, Antarctica, Indian Ocean

53-1231

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Oceanographic surveys, Water pollution, Marine biology, Animals, Physiological effects, Impurities, Human factors, Antarctica—Terra Nova Bay

53-1232

Environmental geochemical and biological features of antarctic oases.

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Limnology, Geochemistry, Cryobiology, Ecology, Human factors, Global warming, Microbiology, Water chemistry, Plant physiology, Plants (botany), Lake ice, Environmental impact, Antarctica

53-1233

Release of methane from permafrost as a result of local warming and other disturbances.

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53-1234

Regions of adverse environmental impact in the Russian Arctic and subarctic.

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53-1235

Preliminary study on the Holocene environment changes in Xinjiang—geologic records and sequence.

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53-1236

Reconstruction of paleovegetation and palaeoclimate of Holocene Hypsithermal in the Hemudu region.

Zhou, Z.K., Xia, Y.J., Liu, W.L., Wu, W.T., *Chinese geographical science*, 1995, 5(3), p.232-241, 17 refs. Paleocology, Paleoclimatology, Quaternary deposits, Palynology, Classifications, Vegetation patterns, Sampling, Correlation, China—Zhejiang

53-1237

Thermophysical properties of aqueous solutions near the equilibrium freezing temperature.

Sawada, I., Yamada, M., Fukusako, S., Kawanami, T., *International journal of thermophysics*, May 1998, 19(3), Symposium on Thermophysical Properties, 13th, Boulder, CO, June 22-27, 1997. Proceedings, p.749-759, 11 refs. Solutions, Brines, Supercooling, Liquid cooling, Thermodynamic properties, Freezing points, Thermal conductivity, Viscosity, Temperature effects, Temperature measurement

53-1238

Species-specific phytoplankton sedimentation in relation to primary production along an inshore-offshore gradient in the Baltic Sea.

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53-1239

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53-1240

Morphometric analysis of Alaskan members of the genus *Potentilla* sect. *Niveae* (Rosaceae).

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53-1241

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Plant physiology, Agriculture, Cold tolerance, Acclimatization, Chemical composition, Chemical analysis, Modification, Experimentation

53-1242

Thermodynamic study of liquid transportation in freezing porous media.

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Frozen ground mechanics, Frozen ground thermodynamics, Mass transfer, Ice lenses, Porous materials, Saturation, Thermal expansion, Frost heave, Soil water migration, Ice water interface, Mathematical models, Theories

53-1243

Allozyme differentiation between lowland and alpine populations of *Pseudorchis abida* s.lat. (Orchidaceae) in Sweden.

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Plant physiology, Grasses, Migration, Origin, Alpine landscapes, Plant tissues, Chemical composition, Chemical analysis, Classifications, Statistical analysis, Sweden

53-1244

Status of *Carex bergrothii* (Cyperaceae) on Gotland, SE Sweden.

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Plants (botany), Subpolar regions, Plant physiology, Plant tissues, Chemical composition, Chemical analysis, Structural analysis, Sampling, Statistical analysis, Classifications, Sweden—Gotland

53-1245

Comparative ecology of *Polystichum aculeatum*, *Pbraunii* and *Plonchitis* in Hordaland, western Norway.

Mütter, H., Birks, H.J.B., Odland, A., *Nordic journal of botany*, 1998, 18(3), p.267-288, 51 refs.

Plants (botany), Plant ecology, Subarctic landscapes, Classifications, Vegetation patterns, Sampling, Statistical analysis, Snow cover effect, Climatic factors, Norway—Hordaland

53-1246

Size and reproduction of *Thelypteris limbosperma* and *Athyrium distentifolium* along environmental gradients in western Norway.

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Plant ecology, Subarctic landscapes, Ecosystems, Distribution, Biomass, Growth, Snow cover effect, Sampling, Seasonal variations, Statistical analysis, Norway

53-1247

Long-term changes in the marine macroalgae of Lågskär, Åland Sea (N Baltic).

Rönnberg, O., Mathiesen, L., *Nordic journal of botany*, 1998, 18(3), p.379-384, 32 refs.

Marine biology, Ocean bottom, Algae, Ecosystems, Plant ecology, Subpolar regions, Biomass, Distribution, Sampling, Classifications, Baltic Sea

53-1248

Monitoring winter freezing in a silt soil in southern Manitoba, Canada using surface DC resistivity soundings.

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Soil freezing, Soil structure, Frozen ground mechanics, Frozen ground temperature, Layers, Thickness, Seismic refraction, Electrical resistivity, Temperature measurement, Sounding, Canada—Manitoba

53-1249

Surface properties of ice studied by atomic force microscopy.

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Ice physics, Ice surface, Topographic features, Ice friction, Ice adhesion, Surface properties, Films, Thickness, Ice solid interface, Mechanical tests, Sliding, Velocity measurement

53-1250

Luminescence study on the inner-sphere hydration number of lanthanide(III) ions in concentrated aqueous salt solutions in fluid and frozen states.

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53-1251

CP/MAS  $^{13}\text{C}$  NMR analyses of the chain conformation and hydrogen bonding for frozen poly(vinyl alcohol) solutions.

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53-1252

Detection of the "44  $\mu\text{m}$ " band of water ice in absorption in combined ISO SWS-LWS spectra.

Dartois, E., et al, *Astronomy and astrophysics*, Oct. 1998, 338(1), p.L21-L24, 29 refs. Extraterrestrial ice, Cosmic dust, Ice detection, Remote sensing, Infrared spectroscopy, Ice crystal optics, Amorphous ice, Spectra, Models, Radiation absorption

53-1253

Si-H bonds produced by ion implantation in silicon and frozen silanes.

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53-1254

Mass balance, meteorological, ice motion, surface altitude, and runoff data at Gulkana Glacier, Alaska, 1993 balance year.

March, R.S., Trabandt, D.C., *U.S. Geological Survey. Water-resources investigation report*, 1997, No.96-4299, 30p., 33 refs.

DLC GB701.W375 No 96-4299

Glaciology, Glacier surveys, Glacial hydrology, Glacial meteorology, Glacier mass balance, Glacier flow, Snow accumulation, Runoff, Seasonal variations, Sampling, United States—Alaska—Gulkana Glacier

53-1255

Machine vision for ice layer thickness measurements.

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DLC TK7801.C36 1997

Aircraft icing, Ice accretion, Ice detection, Ice solid interface, Ice cover thickness, Sensors, Image processing, Photographic techniques, Lasers, Ice optics, Refractivity, Indexes (ratios), Transparence

53-1256

Midwinter start to antarctic ozone depletion: evidence from observations and models.

Roscoe, H.K., Jones, A.E., Lee, A.M., *Science*, Oct. 3, 1997, 278(5335), p.93-96, 32 refs. Ozone, Measurement, Models, Atmospheric composition, Polar atmospheres, Antarctica—Faraday Station

53-1257

New data on the biogeographical unique status of Novaya Zemlya. [Novye dannye o biogeograficheskoi unikal'nosti Novoi Zemli]

Kaliakin, V.N., *Rossiiskaia akademiia nauk. Doklady*, July 1995, 343(1), p.139-141, In Russian. 8 refs. Biogeography, Tundra vegetation, Ecology, Russia—Novaya Zemlya

53-1258

Earth's crust structure of the Barents Sea and northern West Siberia using seismic data. [Stroeenie zemnoi kory Barentseva moria i severa Zapadnoi Sibiri po seismicheskim dannym]

Sokolov, B.A., Piip, V.B., Efimova, E.A., *Rossiiskaia akademiia nauk. Doklady*, Aug. 1995, 343(5), p.687-691, In Russian. 9 refs.

Earth crust, Marine geology, Bottom topography, Seismic surveys, Seismic reflection, Profiles, Barents Sea, Russia—Siberia

53-1259

First results of pollen analyses of the deposits of the glacial lakes of Chukotka. [Pervye rezul'taty palinologicheskogo analiza osadkov lednikovyykh ozer Chukotki]

Lozhkin, A.V., Anderson, P.M., Brubaker, L.B., Prokhorova, T.P., *Rossiiskaia akademiia nauk. Doklady*, June 1995, 342(4), p.540-542, In Russian. 6 refs.

Lacustrine deposits, Glacial lakes, Palynology, Pollen, Paleobotany, Tundra vegetation, Russia—Chukotskiy Peninsula

53-1260

Greenland Summit Ice Cores CD-ROM.

University of Colorado at Boulder. National Snow and Ice Data Center, World Data Center-A for Paleoclimatology, Boulder, CO, NSIDC; WDC-A for Paleoclimatology, 1997, n.p., CD-ROM.

Ice cores, Ions, Isotope analysis, Paleoclimatology, Drill core analysis, Ice composition, Greenland—Summit

53-1261

Dynamics of cryolithosphere in the area of continent-shelf interaction during the last 25000 years (on the example of the East-Siberian Sea).

[Dinamika kriolitofery v zone vzaimodel'stvia shelf-kontinent v poslednie 25,000 let (na primere Vostochno-Sibirskogo moria)]

Danilov, I.D., Komarov, I.A., Vlasenko, A.IU., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.3-8, In Russian with English title and summary. 20 refs.

Paleoclimatology, Pleistocene, Water temperature, Surface temperature, Geocryology, Shores, Frozen rock temperature, Marine geology, Subsea permafrost, Ocean bottom, Russia—East Siberian Sea

53-1262

Off-shore permafrost distribution on the Laptev Sea shelf. [Rasprostraneniye submarinnof merzloty na shelf'e moria Laptevskikh]

Romanovskii, N.N., et al, *Kriosfera zemli*, July-Sep. 1997, 1(3), p.9-18, In Russian with English title and summary. 21 refs.

Continuous permafrost, Permafrost origin, Paleoclimatology, Pleistocene, Computerized simulation, Permafrost distribution, Permafrost forecasting, Geocryology, Shores, Isotherms, Permafrost depth, Marine geology, Subsea permafrost, Ocean bottom, Russia—Laptev Sea

53-1263

Simplest physical models of cryogenic phenomena. [Prostefshie fizicheskie modeli krigennykh iavlenii]

Gorelik, I.A.B., Kolunin, V.S., Reshetnikov, A.K., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.19-29, In Russian with English title and summary. 24 refs.

Geocryology, Mathematical models, Ice growth, Porous materials, Ice formation, Moisture transfer, Unfrozen water content, Soil freezing, Mass transfer

53-1264

Freezing kinetics, thermal strains and heaving of frozen soils. [Kinetika fazovykh perekhodov, temperaturnye deformatsii i puchenie merzlykh gruntov]

Grechishchev, S.E., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.30-34, In Russian with English title and summary. 3 refs.

Soil freezing, Frost heave, Ice formation, Deformation, Anisotropy, Temperature effects, Pressure

53-1265

Ice melting in non-cohesive frozen soils, caused by local pressure. [Plavlenie l'da v nesvlyaznykh merzlykh gruntakh, obuslovlennoe lokal'nymi davleniyami]

Ukhov, S.B., Vlasov, A.N., Lysin, L.D., Merzliakov, V.P., Savatorova, V.L., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.35-38, In Russian with English title and summary. 10 refs.

Noncohesive soils, Frozen ground, Ice melting, Phase transformations, Microstructure, Sands, Minerals, Pressure, Ground thawing

53-1266

Peculiarities of water vapor migration on the frozen ground-snow interface. [Osobennosti migratsii vodianogo para na granitse merzlyi grunt-snezhnyi pokrov]

Golubev, V.N., Seliverstov, I.U.G., Sokratov, S.A., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.39-43, In Russian with English title and summary. 6 refs.

Snow cover, Frozen ground, Water vapor, Vapor transfer, Mass transfer, Temperature gradients, Isotherms

53-1267

Theory of nuclear magnetic relaxation in unfrozen water films. [Teoriia iadernof magnitnoy relaksatsii v plenkakh nezamerzshel' vody]

Anikin, G.V., Plotnikov, S.N., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.44-46, In Russian with English title and summary. 4 refs.

Mathematical models, Unfrozen water content, Nuclear magnetic resonance, Water films, Relaxation (mechanics)

53-1268

Seismic-geological classifications of soils in cryolithozone. [Seizmogeologicheskie klassifikatsii gruntov kriolitofony]

Voronkov, O.K., Motorin, G.A., Mikhaïlovskii, G.V., Kuntsevich, S.P., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.47-54, In Russian with English title and summary. 15 refs.

Geocryology, Frozen ground, Soil classification, Elastic waves, Saline soils, Seismic surveys

53-1269

Study of relationship between dynamic load and strength properties of soft frozen ground. [Issledovaniia vlianiia dinamicheskoi nagruзки na prochnostnye svoystva plastichomerzlykh gruntov]

Kutergin, V.N., Kal'bergenov, R.G., Aksenov, V.I., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.55-60, In Russian with English title and summary. 7 refs.

Frozen ground strength, Dynamic loads, Stress strain diagrams, Loams, Static loads, Russia—Yamal Peninsula

53-1270

Features of saline frozen soil deformability. [Kharakternye cherty deformiruemosti merzlykh zasolennykh gruntov]

Zykov, I.U.D., Chervinskaiia, O.P., Frolov, A.D., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.61-65, In Russian with English title and summary. 6 refs.

Saline soils, Frozen ground mechanics, Frozen ground strength, Elastic properties, Sands, Cryogenic soils, Cryogenic structures, Porosity

53-1271

Features of the structure of elastic oscillation field in non-lithified frozen ground. [Osobennosti struktury polia uprugikh kolebaniy v nelitfitsirovannykh mnogoletnemeryzlykh porodakh]

Skvortsov, A.G., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.66-72, In Russian with English title and summary. 8 refs.

Geocryology, Permafrost, Classifications, Elastic properties, Seismic surveys, Wave propagation

53-1272

Assessment techniques in the analysis of the structure and dynamics of cryolithosphere. [Otsenochnye metody analiza stroeniia i dinamiki kriolitotony]

Kononov, A.A., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.73-78, In Russian with English title and summary. 7 refs.

Freeze thaw cycles, Phase transformations, Analysis (mathematics), Thermal regime, Paleoclimatology, Frozen ground temperature, Soil water, Soil water migration, Forecasts, Temperature variations, Russia—Siberia

53-1273

Isotopic composition of ground ices at the Labaz Lake region (Taymyr). [Izotopnyi sostav podzemnykh i'dov raiona oz. Labaz (Taimyr)]

Chizhov, A.B., Dereviagin, A.I.U., Simonov, E.F., Hubberten, H.W., Siegert, C., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.79-84, In Russian with English title and summary. 11 refs.

Paleoclimatology, Ground ice, Isotope analysis, Ice formation, Origin, Quaternary deposits, Lacustrine deposits, Russia—Labaz, Lake, Russia—Taymyr Peninsula

53-1274

Recent gas hydrate research at the Geological Survey of Canada. [Sovremennye issledovaniia gazogidratov, provodimyie Geologicheskoi sluzhboi Kanady]

Kurfurst, P.J., *Kriosfera zemli*, July-Sep. 1997, 1(3), p.85-87, In Russian with English title and summary. 2 refs.

Hydrates, Permafrost, Geochemistry, Seismic reflection, Research projects, Climatic changes, Safety, Drilling

53-1275

Microflora of the deep glacier horizons of Central Antarctica.

Abyzov, S.S., Mitskevich, I.N., Poglavova, M.N., *Microbiology*, July-Aug. 1998, 67(4), p.451-458, Translated from *Microbiologiya* 67(4), 1998, p.547-555. 21 refs.

Microbiology, Cryobiology, Glacier ice, Microanalysis, Ice cores, Core samplers, Bacteria, Paleoclimatology, Paleocology, Glaciology, Antarctica—Vostok Station

53-1276

Species composition of microscopic fungi in urban snow cover.

Kul'ko, A.B., Marfenina, O.E., *Microbiology*, July-Aug. 1998, 67(4), p.470-472, Translated from *Microbiologiya* 67(4), 1998, p.569-572. 14 refs.

Microbiology, Cryobiology, Fungi, Snow impurities, Snow cover, Environmental impact, Air pollution, Russia—Moscow

53-1277

Argentine Antarctic Expedition, 1995-1996, on board the icebreaker Irizar. [Proyecto Oceanar Buque. Datos preliminares de CTD, XBT y química de la Campaña Antártica de Verano 1995/96. 4ta. etapa a bordo del rompehielos Irizar]

Tosonotto, G.V., Gallo, J.F., Cantoni, L.A., *Buenos Aires. Instituto Antártico Argentino. Contribución*, 1997, No.462, 185p., In Spanish. 3 refs.

Research projects, Oceanographic surveys, Water temperature, Salinity, Chemical analysis, Biomass, Charts, Maps, Antarctica—South Shetland Islands

53-1278

Soil maps and charts of Potter Peninsula. [Península Potter (Isla 25 de Mayo) Antártida Argentina. Mapa detallado de suelos, escala 1:10.000]

Godagnone, R.E., *Buenos Aires. Instituto Antártico Argentino. Contribución*, 1997, No.448, 45p., In Spanish. 9 refs.

Soil analysis, Soil classification, Soil composition, Soil mapping, Meteorological data, Permafrost, Maps, Charts, Polar regions, Antarctica—Potter Peninsula

53-1279

Proceedings.

International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996, Guyenne, T.D., ed, *European Space Agency*, Feb. 1997, ESA SP-405, 300p., In English and Spanish. Refs. passim. For selected papers see 53-1280 through 53-1285.

DLC G70.39.U84 1997

Meetings, Remote sensing, Spaceborne photography, Airborne radar, Synthetic aperture radar, Imaging, Image processing, LANDSAT, Ecosystems, Glaciology

53-1280

Segmentation of textures in ERS-1/SAR images applied to evaluate land degradation of rangelands.

Del Valle, H.F., Frulla, L.A., Gagliardini, D.A., Alvarez, J., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.177-184, 17 refs.

DLC G70.39.U84 1997

Image processing, Airborne radar, Synthetic aperture radar, Mapping, Soil erosion, Deserts, Remote sensing, Data processing, Ecology, Landscape types, Classifications, Topographic surveys, Argentina—Patagonia

53-1281

Using ERS-1 data to evaluate the C band potential for mapping environmental variables. [Utilización de datos ERS-1 para evaluar la potencialidad de la banda C, en los estudios del medio ambiente, sector andino y extra-andino de la Patagonia, Argentina]

González, F.C., Serafini, M.C., Antes, M.E., Cuello, A.R., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.185-194, In Spanish with English summary. 16 refs.

DLC G70.39.U84 1997

Airborne radar, Synthetic aperture radar, Data processing, Ecosystems, Mapping, Topographic surveys, Image processing, Landscape types, Mountains, Argentina—Patagonia

53-1282

Applications of ERS-1/SAR images for monitoring land cover changes in a burnt area of rangelands (central Patagonia, Argentina).

Del Valle, H.F., Gagliardini, D.A., Milovich, J., Defossé, G.E., Dentoni, M.C., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.195-200, 13 refs.

DLC G70.39.U84 1997

Topographic surveys, Airborne radar, Synthetic aperture radar, Image processing, Forest fires, Data processing, Landscape types, Ecosystems, Argentina—Patagonia

53-1283

Study of King George ice cap, South Shetland Islands, Antarctica using radio-echo sounding and SPOT, ERS-1 SAR satellite images.

Macheret, I.U.I.A., Moskalevskii, M.I.U., Simoes, J.C., Ladouch, L., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.249-256, 15 refs.

DLC G70.39.U84 1997

Ice surveys, Ice cover thickness, Radio echo soundings, Airborne radar, Image processing, Glacier melting, Climatic changes, Mathematical models, Glacier surveys, Glacier thickness, Antarctica—King George Island

53-1284

Detection of floating ice in Antarctica. [Detección de hielos flotantes en la Antártida]

Salgado, H., Picasso, M., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.257-261, In Spanish with English summary. 5 refs.

DLC G70.39.U84 1997

Ice navigation, Sea ice distribution, Floating ice, Airborne radar, Synthetic aperture radar, Image processing, Photointerpretation, Air water interactions, Climatic changes, Meteorological data, Data processing, Safety, Ice detection, Ice reporting, Antarctica

53-1285

Monitoring of subglacial volcanic eruption and glacial flood in southern Iceland using ERS-1/2 SAR data.

Müschen, B., Böhm, C., Roth, A., Schwäbisch, M., Holz, A., *European Space Agency*, Feb. 1997, ESA SP-405, International Seminar on the Use and Applications of ERS in Latin America, Viña del Mar, Chile, Nov. 25-29, 1996. Proceedings. Edited by T.D. Guyenne, p.263-271, 6 refs.

DLC G70.39.U84 1997

Airborne radar, Synthetic aperture radar, Image processing, Volcanoes, Icequakes, Subglacial observations, Safety, Flood forecasting, Warning systems, Iceland

53-1286

Performance of the SPIRIT III cryogenic system.

Schick, S., Bell, G., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3122, Infrared spaceborne remote sensing V, Edited by M. Strojnik and B.F. Andresen, p.69-77, 4 refs.

DLC G70.39.I53 1997

Infrared equipment, Performance, Cryogenics, Spacecraft, Infrared reconnaissance, Cooling systems, Thermostats, Temperature control

53-1287

Scattering matrix of nonspherical ice particles determined by the geometrical optics approximation method.

Masuda, K., Takashima, T., *SPIE—The International Society for Optical Engineering. Proceedings*, 1997, Vol.3122, Infrared spaceborne remote sensing V, Edited by M. Strojnik and B.F. Andresen, p.104-115, 20 refs.

DLC G70.39.I53 1997

Remote sensing, Ice crystal optics, Clouds (meteorology), Scattering

53-1288

Ultraviolet radiation at sites on the antarctic coast.

Frederick, J.E., Qu, Z., Booth, C.R., *Photochemistry and photobiology*, Aug. 1998, 68(2), p.183-190, 13 refs.

Ultraviolet radiation, Ozone, Periodic variations, Photosynthesis, Plant physiology, Light effects, Cloud cover, Meteorological data, Antarctica—Palmer Station, Antarctica—McMurdo Station

- 53-1289**  
Late Quaternary geomorphic development of mountain river basins based landform classification: the Kitakami region, northeast Japan. Oguchi, T., *Tokyo University. Department of Geography. Bulletin*, Dec. 1994, No.26, p.15-32, Refs. p.30-32.  
Glacial geology, Pleistocene, Landforms, Classifications, Geomorphology, River basins, Geochronology, Periglacial processes, Slope processes, Japan
- 53-1290**  
Observation of large-scale features with ERS SAR browse images. Laur, H., Dokken, S.T., *Earth observation quarterly*, Aug. 1997, No.55, p.1-5, 4 refs.  
Airborne radar, Synthetic aperture radar, Image processing, Imaging, Oceanographic surveys, Sea ice distribution, Spaceborne photography
- 53-1291**  
Monitoring of polar ozone depletion using ERS-2 GOME. Bittner, M., Dech, S.W., Meisner, R.E., *Earth observation quarterly*, Aug. 1997, No.55, p.6-10, 16 refs.  
Remote sensing, Airborne radar, Image processing, Ozone, Meteorological data, Data processing, Environmental impact, Imaging, Diurnal variations, Polar atmospheres, Periodic variations, Time factor, Antarctica
- 53-1292**  
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**Phase equilibria of H<sub>2</sub>SO<sub>4</sub>, HNO<sub>3</sub>, and HCl hydrates and the composition of polar stratospheric clouds.**

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## 53-1348

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## 53-1351

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Drops (liquids), Water temperature, Freezing, Ice cover thickness, Solidification, Ice water interface, Density (mass/volume), Convection, Interfacial tension, Isotherms, Imaging, Temperature effects

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## 53-1353

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## 53-1354

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53-1355

Statistical modelling of phosphate variations in the Baltic proper.

Pers, C., Danielsson, Å., Rahm, L., *Boreal environment research*, Nov. 11, 1997, 2(3), p.303-315, 14 refs.

Oceanography, Subpolar regions, Water pollution, Organic nuclei, Surface waters, Water chemistry, Mathematical models, Periodic variations, Statistical analysis, Baltic Sea

53-1356

Modelling resuspension in the Bothnian Bay, northern Baltic.

Juntura, E., Koponen, J., Alasaarela, E., *Boreal environment research*, Oct. 30, 1996, 1(1), p.27-35, 18 refs.

Oceanography, Subpolar regions, Sedimentation, Bottom sediment, Suspended sediments, Advection, Water erosion, Wind factors, Water waves, Mathematical models, Sampling, Correlation, Bothnia, Bay

53-1357

Oligocene and Pliocene interglacial events in the Antarctic Peninsula dated using strontium isotope stratigraphy.

Dingle, R.V., McArthur, J.M., Vroon, P., *Journal of the Geological Society, London*, 1997, Vol.154, p.257-264, 50 refs.

Stratigraphy, Isotopes, Age determination, Marine deposits, Paleoclimatology, Isotope analysis, Soil dating, Geochronology, Antarctica—Antarctic Peninsula, Antarctica—King George Island, Antarctica—Cockburn Island

53-1358

Products and processes in Pliocene-Recent, subaqueous to emergent volcanism in the Antarctic Peninsula: examples of englacial Surtseyan volcano construction.

Smellie, J.L., Hole, M.J., *Bulletin of volcanology*, 1997, Vol.58, p.628-646, 75 refs.

Volcanoes, Age determination, Stratigraphy, Glacial geology, Glacier beds, Magma, Soil dating, Geochronology, Tectonics, Antarctica—Antarctic Peninsula, Antarctica—Beethoven Peninsula, Antarctica—Seal Nunataks

53-1359

Planning of river projects and regulation in snow removal operations—introduction to snow removal channeling operations in the upper reaches of the Ishikari River. [Shoryusetsu jigyo ni okeru kasen keikaku oyobi kanri unei keikaku—Ishikari-gawa joryu iki ni okeru shoryusetsu-yo suidonyu jigyo no shokai]

Mizobuchi, Y., Itou, Y., Maeda, S., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.21-26, In Japanese. 2 refs.

Snow removal, Snow disposal, Snow melting, River flow, Flow control, Channels (waterways), Japan—Hokkaido

53-1360

Designing snow melting equipment using hot springs water. [Onsensui o riyō shita shoryusetsu shisetsu keikaku ni tsuite]

Kamio, K., Miura, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.27-32, In Japanese. 3 refs.

Snow melting, Artificial melting, Snow removal, Hot springs, Water pipes, Heat pipes, Road maintenance, Japan—Hokkaido

53-1361

Method for detecting frost heave susceptible roadbeds. [Tojosei roban no hantelho]

Isoda, T., Suzuki, T., Takahashi, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.105-110, In Japanese. 3 refs.

Roadbeds, Subgrade soils, Soil freezing, Frost action, Frost heave, Frost resistance, Frost forecasting, Frozen ground strength, Road maintenance, Japan—Hokkaido

53-1362

Studies on scaling deterioration using large samples. [Ogata kyoshitai o mochi ita sukeringu rekka ni kansuru kenkyu]

Abe, K., Sakai, K., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.111-116, In Japanese. 3 refs.

Concrete structures, Concrete durability, Corrosion, Frost action, Frost resistance, Ocean environments

53-1363

Basic characteristics of recycled concrete aggregates used as road aggregates in snowy cold regions. [Sekisetsu kanreichi ni okeru konkurito saisei kotsuzai no doro-yo kotsuzai toshite no kihon seijō]

Abe, R., Ogasawara, A., Yoshino, M., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.117-120, In Japanese. 5 refs.

Concrete aggregates, Roadbeds, Frost protection, Frost resistance, Freeze thaw tests, Subgrade maintenance, Trafficability, Road maintenance

53-1364

How facilities should be to accommodate the elderly and disabled in the north (part 2). [Hokkoku ni okeru koreisha,shintai shogaisha no riyō o koryō shita shisetsu no arikata ni tsuite (sono 2)]

Yamaga, T., Nakayama, M., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.201-204, In Japanese.

Houses, Residential buildings, Cold weather construction, Human factors engineering, Health, Regional planning, Japan

53-1365

Studies on snowplows—studies on improving snow removal efficiency at designated sites. [Josetsu kikai ni kansuru chosa—tokutei kasho josetsu no koritsuka ni kansuru chosa]

Hokkaido Development Bureau, *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.221-240, In Japanese.

Motor vehicles, Tires, Snow removal equipment, Road maintenance

53-1366

Tests on the development of shear pinless devices for snowplows. [Sunopurau shapinresu sochi no kaihatsu ni kansuru chosa shiken]

Okita, T., Usami, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.243-248, In Japanese.

Motor vehicles, Snow removal equipment, Road maintenance

53-1367

Tests on surface components of snow removal drains—development of machinery to clear away blockages. [Ryusetsuko no menteki seibi ni kansuru chosa shiken—heisoku kaijo kikai no kaihatsu]

Ueno, H., Satou, S., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.249-254, In Japanese.

Snow removal, Snow removal equipment, Drains, Water pipes, Channels (waterways), Road maintenance

53-1368

Tests on detecting cavities beneath the pavement. [Romen-ka kudo tansa ni kansuru chosa shiken]

Endoh, Y., Ishizuka, Y., Tanizaki, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(1), p.255-260, In Japanese.

Pavements, Thaw weakening, Subsurface investigations, Road maintenance

53-1369

Snow countermeasures in the Soya region—snow shelter at Esan on National Highway 238 (part one). [Soya chiho no bosetsu taisaku—ippan kokudo 238-go Esan-hen pakingu sheruta ni tsuite (dai ichi ho)]

Takeda, Y., Keage, K., Kondou, K., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.57-60, In Japanese. 2 refs.

Blowing snow, Snowdrifts, Snowsheds, Safety, Highway planning, Road maintenance, Japan—Hokkaido

53-1370

Development of intelligent delineator systems. [Interijento derinieta shisutemu no kaihatsu ni tsuite]

Fukuzawa, Y., Kajiya, Y., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.61-68, In Japanese. 2 refs.

Blowing snow, Visibility, Safety, Warning systems, Road maintenance, Japan—Hokkaido

53-1371

Evaluation of winter road surfaces based on the new road surface classification. [Shin romen bunrui ni motozuku toki romen no hyoka ni tsuite]

Matsuzawa, M., Kajiya, Y., Takagi, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.69-76, In Japanese. 2 refs.

Road icing, Skid resistance, Snow removal, Weather forecasting, Safety, Highway planning, Road maintenance, Japan—Hokkaido

53-1372

Sliding coefficients on an icy road. [Ippan doro no seppyo romen ni okeru suberi masatsu keisu ni tsuite]

Mima, H., Takagi, H., Tsutae, A., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.77-84, In Japanese. 1 ref.

Road icing, Tires, Rubber ice friction, Rubber snow friction, Skid resistance, Safety, Road maintenance, Japan—Hokkaido

## 53-1373

Analysis of winter skid accidents in Hokkaido with the popularization of studless tires. [Sutad-doresu-ka ni okeru Hokkaido no toki surippu jiko no bunseki]

Nagai, T., Takagi, H., Onuma, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.85-92, In Japanese. 2 refs.

Road icing, Tires, Rubber ice friction, Rubber snow friction, Skid resistance, Accidents, Safety, Highway planning, Road maintenance, Japan—Hokkaido

## 53-1374

Pedestrian slip and fall accidents on icy roads subject to extreme slipperiness—report from fire department responses. [Hijo-ni suberi yasui toketsu romen ni okeru hokosha no tento jiko ni tsuite—shobokyoku ni okeru kyukyu katsudo kara no hokoku]

Nihonyanagi, M., Kawaguchi, M., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.93-98, In Japanese. 3 refs.

Road icing, Skid resistance, Accidents, Human factors engineering, Health, Safety, Road maintenance, Japan—Hokkaido

## 53-1375

Test pavements as countermeasures for icy roads—results for 1994. [Toketsu romen taisaku shiken hoso—Heisel 6 nendo chosa kekka]

Katayama, K., Ito, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.99-106, In Japanese.

Road icing, Pavements, Rubber snow friction, Rubber ice friction, Skid resistance, Safety, Urban planning, Road maintenance, Japan—Hokkaido

## 53-1376

Road icing countermeasures in the Hokkaido Development Bureau. [Hokkaido Kaihatsukyoku ni okeru toketsu romen taisaku ni tsuite]

Kawamura, K., Takagi, H., Onuma, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.107-112, In Japanese. 2 refs.

Road icing, Chemical ice prevention, Salting, Sanding, Snow removal, Road maintenance, Japan—Hokkaido

## 53-1377

Winter road countermeasures using the spreading of anti-icing chemicals. [Toketsu boshizai shimidashi koho ni yoru toki romen taisaku]

Kanou, H., Iwakura, M., Mimura, K., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.113-118, In Japanese. 1 ref.

Road icing, Chemical ice prevention, Salting, Road maintenance, Japan—Hokkaido

## 53-1378

Construction design and maintenance of the Shungaku Bridge deck. [Shungakkyo Jobu kasetsu koji no shiko kekaku to kanri ni tsuite]

Yano, S., Ono, T., Nakajima, S., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(2), p.275-282, In Japanese. 4 refs.

Bridges, Cold weather construction, Snow loads, Snow removal, Road maintenance, Japan—Hokkaido

## 53-1379

Development of a snowmelt and flood forecasting system—results of re-analysis of the Toyohira River drainage basin. [Yusetsu kozui yosoku shisutemu no kaihatsu ni tsuite—Toyohira-gawa ryuiki de no saigen kaiseki kekka ni tsuite]

Tanise, A., Takei, M., Suzuki, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(3), p.57-62, In Japanese. 3 refs.

River basins, Snow hydrology, Snowmelt, Runoff forecasting, Flood forecasting, Mathematical models, Japan—Hokkaido

## 53-1380

Study on improving the accuracy of winter flow observations. [Toki kansoku ryuryo no seido kōjo ni kansuru ikkosatsu]

Yamashita, S., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(3), p.63-68, In Japanese. 5 refs.

River ice, Ice water interface, Ice cover effect, River flow, Flow rate, Flow measurement, Mathematical models, Statistical analysis, Japan—Hokkaido

## 53-1381

Development of equipment and methods to test the durability of rock materials. [Canseki zairyo no taikyusai shikenki to shikenho no kaihatsu]

Onodera, Y., Hideshima, Y., Ota, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(3), p.205-210, In Japanese. 6 refs.

Earth dams, Rock fills, Concrete durability, Frost resistance, Freeze thaw tests, Japan—Hokkaido

## 53-1382

Meeting the challenge of size and diversity.

Boissoneault, M., *Avalanche review*, Autumn 1998, 17(1), p.1,4-5.

Avalanches, Avalanche tracks, Avalanche forecasting, Avalanche triggering, Accidents, Safety, Road maintenance, Highway planning, Canada—British Columbia

## 53-1383

Recycled powder and other types of near-surface faceting.

Birkeland, K.W., *Avalanche review*, Autumn 1998, 17(1), p.6-7, 12 refs.

Snow crystal structure, Snow recrystallization, Metamorphism (snow), Snow surface, Snow cover stability, Avalanche forecasting

## 53-1384

Artificial melting of snow and ice at the water intakes of the Misaki Drainage Facility. [Misaki halsui kijo shusuike no seppyo yukai taisaku]

Yoshizawa, J., Takeda, S., Karino, S., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(4), p.75-80, In Japanese.

Drains, Drainage, Water intakes, Artificial melting, Snow removal, Ice prevention, Ice removal, Japan—Hokkaido

## 53-1385

Operation of an ice control breakwater at the Saroma Lagoon fishing port—ice boom method. [Saroma-ko gyoko bohatel (bohyo) no shiko ni tsuite—ice boom koho]

Oda, K., Toyama, T., Kaizu, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1995(Pub. Feb. 96), 39(4), p.261-266, In Japanese. 2 refs.

Ports, Ice control, Ice booms, Japan—Hokkaido

## 53-1386

Snow metamorphisms. [Les métamorphoses de la neige]

Sergeant, C., *Neige et avalanches*, Sep. 1998, No.83, p.1-10,32, In French with English summary. Metamorphism (snow), Snow cover structure, Snow stratigraphy, Snow crystal structure, Snow water content, Snow cover stability, Avalanche forecasting

## 53-1387

Free remarks on avalanches. [Libres propos sur les avalanches]

Zuanon, J.P., *Neige et avalanches*, Sep. 1998, No.83, p.11-13,32, In French with English summary. Avalanches, Avalanche forecasting, Accidents, Safety, France

## 53-1388

Snow coverage and climate variations. [Enneigement et variations du climat]

Martin, E., *Neige et avalanches*, Sep. 1998, No.83, p.14-17,32, In French with English summary. Snow cover distribution, Snowfall, Snow line, Global warming, France—Alps

## 53-1389

Legal responsibility on ski runs: the legal markers are unclear. [Responsabilités sur les pistes de ski: un ballage législatif incertain]

Grognet, A., *Neige et avalanches*, Sep. 1998, No.83, p.18-19,32, In French with English summary. Avalanches, Accidents, Safety, Legislation, France

## 53-1390

Study of the behaviour of a snow layer deposited on the pavement. [Étude du comportement de la neige sur une chaussée]

Borel, S., *Neige et avalanches*, Sep. 1998, No.83, p.20-23,32, In French with English summary. Snowfall, Weather forecasting, Safety, Road maintenance

## 53-1391

Avalanche triggering techniques used for road protection in the USA. [La protection des routes contre les avalanches aux USA]

Meffre, J.F., *Neige et avalanches*, Sep. 1998, No.83, p.24-27,32, In French with English summary. Avalanche triggering, Blasting, Safety, Road maintenance, Cost analysis, United States—California, United States—Nevada

## 53-1392

Ice thrust in reservoirs.

Carter, D., Sodhi, D.S., Stander, E., Caron, O., Quach, T., *MP 5251, Journal of cold regions engineering*, Dec. 1998, 12(4), p.169-183, 24 refs.

Reservoirs, Ice mechanics, Ice solid interface, Dams, Ice floes, Ice push, Static loads, Stress concentration, Cracking (fracturing), Compressive properties, Mechanical tests, Mathematical models

A three-year program was undertaken to measure the magnitude of static ice forces in four reservoirs located in central and northern Quebec. These static forces may be generated by a temperature change or may arise from such other mechanisms as water level variations, wind, and current drag force. Field observations have revealed two important facts: ice covers have circumferential cracks caused either by water level variations or thermal contraction; and the static ice forces are, in some instances, sufficient to trigger an instability of the broken ice covers by buckling. Noting that an ice cover cannot transmit a force to a structure larger than its own resistance, an upper bound for static forces was derived by determining the in-plane compression force at which a fragmented ice cover collapses. Empirical formulas are presented for three typical structure shapes: retaining walls, sluice gates, and piers. These formulas correlate well with the field data collected from the four dam sites, and suggest that the maximum ice thrust may simply be defined as a function of ice thickness and contact geometry.

## 53-1393

Longitudinal dispersion in ice-covered rivers.

Beltaos, S., *Journal of cold regions engineering*, Dec. 1998, 12(4), p.184-201, 27 refs. For another version see 49-2371.

River flow, River ice, Advection, Shear flow, Dispersions, Water pollution, Turbulent diffusion, Ice cover effect, Mathematical models, Mechanical tests

## 53-1394

**Structural ice control alternatives for middle Mississippi River.**

Tuthill, A.M., Mamone, A.C., MP 5252, *Journal of cold regions engineering*, Dec. 1998, 12(4), p.202-220, 15 refs.

River flow, River ice, Ice water interface, Ice jams, Frazil ice, Ice conditions, Profiles, Ice control, Ice booms, Hydraulic structures, Computerized simulation, United States—Missouri—Mississippi River

The middle Mississippi River, which extends from the mouth of the Missouri River near St. Louis to the confluence with the Ohio River at Cairo, IL, is a critical navigation route throughout the year. During cold periods, the ice accumulations and ice jams that form on this reach can delay or suspend winter navigation, incurring great costs to industry as well as cities and towns whose economies depend on river commerce. Much of this ice originates in the Missouri River. With the onset of warmer air temperatures, the rapid release of these ice accumulations can result in substantial damage to river structures such as dikes, revetments, and levees. This study analyzed historical data and used numerical hydraulic models to assess the possibility of structural solutions to these ice problems. The study identified reach locations where structural ice control might be possible. A simple computer model then simulated the upstream progression of ice covers on the middle Mississippi to assess the feasibility of various ice control alternatives. An ice retention structure located on the Missouri River near its mouth was found to be the most favorable of the structural ice control options considered.

## 53-1395

**Mountain climate and periglacial phenomena in the Faeroe Islands.**

Humlum, O., Christiansen, H.H., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.189-211, With French summary. 76 refs.

Geomorphology, Mountain soils, Climatic factors, Periglacial processes, Altitude, Air temperature, Degree days, Nivation, Frozen ground mechanics, Patterned ground, Permafrost indicators, Terminology, Denmark—Faeroe Islands

## 53-1396

**Influence of mineral earth hummocks on subsurface drainage in the continuous permafrost zone.**

Quinton, W.L., Marsh, P., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.213-228, With French summary. 27 refs.

Permafrost hydrology, Continuous permafrost, Tundra soils, Water table, Slope processes, Runoff, Geomorphology, Patterned ground, Hummocks, Permeability, Channels (waterways), Subsurface drainage, Canada—Northwest Territories—Siksik Creek

## 53-1397

**Impact of climatic factors on the active layer and permafrost at Barrow, Alaska.**

Zhang, T., Stamnes, K., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.229-246, With French summary. 26 refs.

Permafrost physics, Active layer, Permafrost thermal properties, Climatic factors, Soil temperature, Surface temperature, Soil water, Snow cover effect, Snow depth, Depth hoar, Thaw depth, Mathematical models, United States—Alaska—Barrow

## 53-1398

**Late Cenozoic permafrost history of the Russian Arctic.**

Rozenbaum, G.E., Shpolianskaia, N.A., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.247-273, With French summary. 63 refs.

Permafrost origin, Permafrost distribution, Arctic landscapes, Pleistocene, Paleoclimatology, Geocryology, Classifications, Mapping, History, Russia

## 53-1399

**Radiocarbon dating and postglacial evolution, upper Valtellina and Livignese area (Sondrio, central Italian Alps).**

Calderoni, G., Guglielmin, M., Tellini, C., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.275-284, With French summary. 23 refs.

Geomorphology, Paleoclimatology, Quaternary deposits, Alpine landscapes, Permafrost indicators, Periglacial processes, Rock glaciers, Carbon isotopes, Radioactive age determination, Geochronology, Italy—Alps

## 53-1400

**Occurrence of extrazonal periglacial landforms in the lowlands of western Japan and Korea.**

Oguchi, T., Tanaka, Y., *Permafrost and periglacial processes*, July-Aug. 1998, 9(3), p.285-294, With French summary. 52 refs.

Geomorphology, Landforms, Landscape development, Paleocology, Vegetation patterns, Periglacial processes, Freeze thaw cycles, Snow cover effect, Distribution, Temperature effects, Japan, Korea

## 53-1401

**States implement anti-icing strategies.**

Nassif, S., *Roads & bridge*, Dec. 1997, 35(12), p.16. Road icing, Winter maintenance, Road maintenance, Ice control, Chemical ice prevention, Education

## 53-1402

**Razing the winter wonderland.**

Banasiak, D., *Roads & bridge*, Dec. 1997, 35(12), p.24-27.

Snow removal equipment, Road maintenance, Winter maintenance, Classifications, Design

## 53-1403

**Ag by-product joins fight on snow.**

Banasiak, D., *Roads & bridge*, Dec. 1997, 35(12), p.28-29.

Road icing, Ice control, Winter maintenance, Snow melting, Chemical ice prevention, Solutions, Polymers, Viscosity, Environmental protection

## 53-1404

**Turning pro on anti-icing. Roads & bridge.**

1997, 35(12), p.30-31.

Road icing, Winter maintenance, Road maintenance, Chemical ice prevention, Ice control, Snow melting, Salting, Classifications

## 53-1405

**Incorporation of western components with Russian drilling operations, case history of Ardalín field operations, Timan Pechora Basin.**

Brady, S., Reyna, E., *SPE drill & completion*, Mar. 1997, 12(1), p.49-54, 2 refs.

Petroleum industry, Subpolar regions, Oil wells, Drilling, Equipment, Modification, Subpolar regions, Logistics, International cooperation, Russia—Timan Pechora Basin

## 53-1406

**Thermal and moisture protection manual: for architects, engineers, and contractors.**

Beall, C., New York, McGraw-Hill, 1999, 503p., Refs. p.497-500.

DLC TH9031.B294 1999

Buildings, Indoor climates, Microclimatology, Walls, Heat flux, Moisture, Damage, Freeze thaw cycles, Protection, Construction materials, Thermal insulation, Design criteria, Manuals, Standards, Thermal analysis, Waterproofing

## 53-1407

**Conditional symmetric instability: methods of operational diagnosis and case study of 23-24 February 1994, eastern Washington/Oregon snowstorm.**

DeVior, G.A., *U.S. National Oceanic and Atmospheric Administration. National Weather Service. Western Region. NOAA technical memorandum*, May 1998, NWS WR-254, 16p. + figs., PB98-144660, 20 refs.

Meteorological data, Weather forecasting, Snowstorms, Snowfall, Precipitation (meteorology), Atmospheric circulation, United States—Washington, United States—Oregon

## 53-1408

**Cold temperature effects on stress laminated bridge decks. Final report.**

Seavey, R.T., Erikson, R.W., *Minnesota Department of Transportation. Local Road Research Board. Report*, Dec. 1997, MN/RC-1998/03, 33p., PB98-144686, 6 refs.

Bridges, Cold weather operation, Wooden structures, Cold stress, Cold weather performance, Thermal properties, Moisture detection, Experimentation, Cold weather tests

## 53-1409

**Freeze-thaw durability of high-strength concrete. Final report.**

Kriesel, R.C., French, C.E., Snyder, M.B., *Minnesota Department of Transportation. Office of Research Administration. St. Paul, MN. Report*, Jan. 1998, No.1998-10, 195p., PB98-166614, 49 refs. Appendixes A through H are listed in the table of contents but do not appear on the fiche.

Cold weather performance, Concrete durability, Concrete strength, Bridges, Flexural strength, Shear strength, Concrete aggregates, Freeze thaw tests, Mechanical tests, Concrete freezing, Frost resistance

## 53-1410

**Meridional ocean heat transport across the Antarctic Circumpolar Current.**

Li, H.H., College Station, Texas A&M University, 1996, 98p., University Microfilms order No.AAD97-O1676, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 57(8), p.4950.

Oceanographic surveys, Meteorological data, Ocean currents, Models, Heat transfer, Air water interactions, Water temperature

## 53-1411

**Power spectral analysis of the ionospheric ULF micropulsation data obtained from the 1980-81 Siple and the 1985-86 South Pole Balloon campaigns.**

Lee, K.Y., Houston, University, 1996, 236p., University Microfilms order No.AAD97-O0694, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 57(8), p.5111.

Geoelectricity, Geomagnetism, Atmospheric physics, Research projects, Magnetometers, Spectroscopy, Magnetic surveys, Electric fields, Fluid mechanics, Antarctica—South Pole

## 53-1412

**Altimeter waveform model for combined surface and volume scattering.**

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Height finding, Radar, Measuring instruments, Scattering, Recording instruments, Electronic equipment, Ice sheets, Ice shelves, Models, Glacier surfaces, Glacier thickness, Greenland

## 53-1413

**Dynamics of mesoscale cyclogenesis adjacent to the Pacific coast of Antarctica.**

Carrasco-Cerda, J.F., Columbus, Ohio State University, 1994, 312p., University Microfilms order No.AADAA-19516965, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 56(1), p.293.

Meteorological data, Atmospheric disturbances, Marine meteorology, Image processing, Spaceborne photography, Atmospheric pressure, Weather stations, Synoptic meteorology, Mathematical models, Wind (meteorology), Antarctica—West Antarctica

## 53-1414

**Antifreeze glycoproteins of two unrelated polar fishes: gene structure, organization and evolution.**

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Acclimatization, Animals, Physiological effects, Marine biology, Molecular structure, Cold stress, Cold tolerance, Paleocology, Antifreezes, Antarctica

## 53-1415

**Corderite gneisses and high temperature metamorphism in the Fossdick Mountains, West Antarctica, with implications for breakup processes in the Pacific sector of the Mesozoic Gondwana margin.**

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Tectonics, Frozen rocks, Glacial geology, Earth crust, Geocryology, Thermal analysis, Models, Antarctica—Fossdick Mountains

## 53-1416

**Crystal structures and hydrogen bonding of carbohydrates: D-threitol, lactulose dihydrate, raffinose pentahydrate, alpha/beta panose, stachyose tetrahydrate, nystose trihydrate; hydrogen bonding in tri- and tetrasaccharides; crystallization of ice in the presence of antifreeze polypeptides.**  
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Ice crystal growth, Hydrogen bonds, Ice crystal structure, Antifreezes, Molecular structure, Chemical composition

## 53-1417

**Microwave remote sensing techniques for vapor, liquid and ice parameters.**

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Remote sensing, Models, Atmospheric composition, Radiation measuring instruments, Water vapor, Temperature inversions, Ice physics, Liquids, Cloud physics

## 53-1418

**Determination of the climate change in the Russian Arctic using a synoptic climatological approach.**

Ye, H.H., Newark, University of Delaware, 1996, 149p., University Microfilms order No.AADAA-19610499, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 56(12), p.6644.  
Climatic changes, Atmospheric circulation, Polar atmospheres, Synoptic meteorology, Air masses, Air temperature, Meteorological data, Russia

## 53-1419

**Formation of eskers based on their morphology, stratigraphy, and lithological composition, Labrador, Canada.**

Bolduc, A.M., Bethlehem, PA, Lehigh University, 1992, 365p., University Microfilms order No.AAD92-26053, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 53(5), p.2215.  
Glacial deposits, Geomorphology, Stratigraphy, Lithology, Subglacial drainage, Glacial geology, Sedimentation, Subglacial observations, Tunnels, Canada—Labrador

## 53-1420

**Pressure drop and heat transfer in turbulent ice-water slurries in horizontal pipes.**

Knodel, B.D., Chicago, University of Illinois, 1995, 209p., University Microfilms order No.AADAA-19612498, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 56(12), p.7012.  
Experimentation, Water pressure, Heat transfer, Water pipes, Ice water interface, Turbulent flow, Pipe flow

## 53-1421

**Structured water mobile below the freezing point in aqueous solutions of a triple-helical polysaccharide schizophyllan.**

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Solutions, Frozen liquids, Polymers, Molecular structure, Phase transformations, Water structure, Freezing points, Hygroscopic water, Unfrozen water content, Dielectric properties, Electrical measurement

## 53-1422

**Time-delayed response of the solar total irradiance variation to long-term solar magnetic cycle amplitude modulation as inferred by sunspot relative number and isotope data of  $^{10}\text{Be}$  in the Greenland ice core and land air temperature variation of the Earth.**

Yoshimura, H., *Nihon Gakushuin. Proceedings of the Japan Academy. Series B*, Dec. 1996, 72(10), p.197-201, 18 refs.

Climatology, Surface temperature, Global warming, Solar radiation, Radiance, Solar activity, Periodic variations, Electromagnetic properties, Age determination, Ice sheets, Ice cores, Isotope analysis, Correlation, Greenland

## 53-1423

**Mid-Wisconsinan eolian deposits of the Kittigazuit Formation, Tuktoyaktuk Coastlands, Northwest Territories, Canada.**

Dallimore, S.R., Wolfe, S.A., Matthews, J.V., Jr., Vincent, J.S., *Canadian journal of earth sciences*, Nov. 1997, 34(11), p.1421-1441, With French summary. 42 refs.

Pleistocene, Subpolar regions, Sedimentation, Paleogeology, Eolian soils, Permafrost indicators, Periglacial processes, Sands, Lithology, Radioactive age determination, Geochronology, Canada—Northwest Territories—Tuktoyaktuk Coastlands

## 53-1424

**Holocene eolian activity in the Minot dune field, North Dakota.**

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Pleistocene, Plains, Geomorphology, Quaternary deposits, Eolian soils, Sedimentation, Wind factors, Sands, Evapotranspiration, Stratigraphy, Geochemistry, Origin, United States—North Dakota

## 53-1425

**Meteorological controls on wind erosion during foehn wind events in the eastern Southern Alps, New Zealand.**

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Alpine landscapes, Soil erosion, Soil air interface, Storms, Wind erosion, Sediment transport, Eolian soils, Freeze thaw cycles, Ice needles, Meteorological data, New Zealand—Southern Alps

## 53-1426

**Late Wisconsinan deglacial history of the east-central Taseko Lakes area, British Columbia.**

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Pleistocene, Glacial geology, Glacial hydrology, Ice sheets, Ice deterioration, Geomorphology, Sedimentation, Moraines, Glacial lakes, Subglacial drainage, Glacier oscillation, Geological surveys, Canada—British Columbia—Taseko Lakes

## 53-1427

**Influence of Kola Peninsula, continental European and marine sources on the number concentrations and scattering coefficients of the atmospheric aerosol in Finnish Lapland.**

Virkkula, A., Hillamo, R.E., Kerminen, V.M., Stohl, A., *Boreal environment research*, Jan. 14, 1998, 2(4), p.317-336, 45 refs.

Climatology, Air pollution, Origin, Polar atmospheres, Air masses, Wind direction, Aerosols, Condensation nuclei, Sampling, Backscattering, Classifications, Finland—Lapland, Russia—Kola Peninsula

## 53-1428

**Nutrient intrusions at the entrance to the Gulf of Finland.**

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Oceanography, Water chemistry, Hydrography, Nutrient cycle, Subpolar regions, Marine biology, Biomass, Microbiology, Profiles, Density (mass/volume), Sampling, Finland, Gulf, Baltic Sea

## 53-1429

**Metal concentrations in sediments in acidifying lakes in Finnish Lapland.**

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Limnology, Subpolar regions, Lake water, Water pollution, Metals, Bottom sediment, Sampling, Hydrogeochemistry, Environmental tests, Finland—Lapland

## 53-1430

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Climatology, Polar atmospheres, Air temperature, Cloud physics, Aerosols, Polar stratospheric clouds, Sounding, Lidar, Ice crystal size, Particle size distribution, Heterogeneous nucleation, Profiles, Norway—Ny-Ålesund

## 53-1431

**Sublimation of snowpacks in subalpine conifer forests.**

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Forest canopy, Snow hydrology, Snow cover structure, Snow evaporation, Slope orientation, Sublimation, Vapor transfer, Snow air interface, Spheres, Simulation, Forecasting, Indexes (ratios), United States—Colorado—Fraser Experimental Forest

## 53-1432

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Plant physiology, Trees (plants), Plant tissues, Roots, Damage, Frost resistance, Cold tolerance, Acclimatization, Temperature effects, Simulation, Cold weather survival, Finland

## 53-1433

**Early seedling establishment of *Picea abies* in small forest gaps on the Swiss Alps.**

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Forest ecosystems, Trees (plants), Alpine landscapes, Vegetation patterns, Growth, Survival, Revegetation, Rain, Soil water, Slope orientation, Light effects, Topographic effects, Simulation, Switzerland—Alps

## 53-1434

**Tectonic evolution of Bransfield Strait, West Antarctica.**

Barker, D.H.N., Austin, University of Texas, 1997, 273p., University Microfilms order No.AAD98-22539, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 59(1), p.129.

Tectonics, Marine geology, Structural analysis, Ocean bottom, Bottom topography, Glacial geology, Geophysical surveys, Antarctica—Bransfield Strait

## 53-1435

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Huntley, D.H., New Brunswick, University of New Brunswick, 1997, 197p., University Microfilms order No.AADNQ-23864, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 58(12), p.6448.

Limnology, Glacial geology, Glaciation, Lacustrine deposits, Landforms, Glacial erosion, Glacier oscillation, Sedimentation, Canada—British Columbia

## 53-1436

**Constitutive modelling of time-dependent stress-strain behaviour of soils.**

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Models, Soil strength, Stresses, Strains, Elastic properties, Frozen ground, Soil tests, Frozen ground strength, Frozen ground compression, Soil creep

## 53-1437

**Engineering properties of high performance concrete containing large volume of Class C fly ash.**

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Concrete aggregates, Cold weather performance, Mechanical tests, Cost analysis, Concrete strength, Concrete admixtures, Prestressed concretes, Concrete structures, Concrete durability, Freeze thaw tests, Frost resistance, Winter concreting, Canada

## 53-1438

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Glacial geology, Climatic changes, Paleoclimatology, Forest fires, Vegetation, Seasonal variations, Climatic factors, United States—Wyoming—Yellowstone National Park

## 53-1439

**Theoretical studies of adsorption on surfaces: silane on the silicon (100)-(2X1) surface and hypochlorous acid on the ice Ih surface.**

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Adsorption, Surface properties, Ice surface, Chemical analysis, Ozone, Atmospheric composition, Molecular structure, Ice water interface, Molecular energy levels, Cloud physics

## 53-1440

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Cloud cover, Climatic factors, Polar atmospheres, Meteorological data, Seasonal variations, Air ice water interaction, Atmospheric circulation, Air temperature, Clouds (meteorology), Sea ice, Mathematical models, Marine atmospheres, Arctic Ocean

## 53-1441

**Surface water dynamics and biogeochemical fluxes of Loch Vale Watershed, Colorado.**

Baron, J.S., Fort Collins, Colorado State University, 1997, 133p., University Microfilms order No.AAD92-16171, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec.B, 53(1), p.52.

Limnology, Lakes, Surface waters, Geochemistry, Cryobiology, Hydrography, Air ice water interaction, Meteorological factors, Climatic factors, Seasonal variations, Hydrogeochemistry, Geochemical cycles, Nutrient cycle, Colorado—Loch Vale Watershed

## 53-1442

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Rivers, Runoff, Models, Hydrology, Watersheds, Fluid dynamics, Thixotropy, Frozen ground, Snowmelt, Drainage, Canada—Alberta

## 53-1443

**Methane emission from peatlands in northern Minnesota.**

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Peat, Geochemistry, Forest ecosystems, Variations, Water table, Temperature measurement, Wetlands, Seasonal variations, Soil microbiology, Soil air interface, Atmospheric composition, Nutrient cycle, Geochemical cycles, United States—Minnesota

## 53-1444

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Flood forecasting, Bank protection (waterways), Dams, Ice jams, Mathematical models, Performance

## 53-1445

**Analysis of SAR data of the polar oceans: recent advances.**

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DLC GB2595.A63 1998

Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Drift, Radar tracking, Synthetic aperture radar, Spaceborne photography, Image processing, Data processing

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## 53-1447

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## 53-1448

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## 53-1449

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## 53-1450

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## 53-1451

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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Drift, Radar tracking, Synthetic aperture radar, Spaceborne photography, Image processing, Data processing, Computer applications

53-1457

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53-1458

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Ice physics, Ice melting, Slush, Heat transfer coefficient, Phase transformations, Liquid solid interfaces, Films, Interfacial tension, Hydrocarbons, Mechanical tests, Analysis (mathematics), Temperature effects

53-1459

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53-1460

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53-1461

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53-1462

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53-1463

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53-1464

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53-1465

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53-1466

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53-1467

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53-1468

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53-1469

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Climatology, Cloud cover, Cloud physics, Optical properties, Radiometry, Seasonal variations, Classifications, Ice detection, Forecasting

53-1470

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53-1471

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53-1472

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53-1474

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53-1475

**High-resolution records of soil humification and paleoclimate change from variations in speleothem luminescence excitation and emission wavelengths.**

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Sea ice exhibits a marked transition in its fluid transport properties at a critical brine volume fraction  $p_c$  of about 5%, or temperature  $T_c$  of about -5°C for salinity of 5 parts per thousand. For temperatures warmer than  $T_c$ , brine carrying heat and nutrients can move through the ice, whereas for colder temperatures the ice is impermeable. This transition plays a key role in the geophysics, biology and remote sensing of sea ice. Percolation theory can be used to understand this critical behavior of transport in sea ice. The similarity of sea ice microstructure to compressed powders is used to theoretically predict  $p_c$  of about 5%.

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Natural resources, Natural gas, Crude oil, Forecasting, Paleoclimatology, Geochemistry, Alluvium, Lacustrine deposits, Russia—Siberia

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Global warming, Precipitation (meteorology), Mass flow, Mudflows, Classifications, Snow hydrology, Snow melting, Forecasting, Distribution, Russia, Canada

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Freeze drying, Vacuum freezing, Phase transformations, Porous materials, Sublimation, Condensation, Vapor transfer, Mass transfer, Heat transfer, Microwaves, Mathematical models, Thermodynamics

## 53-1539

Southwestern Barents Sea margin: late Mesozoic sedimentary basins and crustal extension.

Breivik, A.J., Faleide, J.I., Gudlaugsson, S.T., *Tectonophysics*, July 30, 1998, 293(1-2), p.21-44, 41 refs.

Pleistocene, Marine geology, Tectonics, Subpolar regions, Earth crust, Thickness, Sedimentation, Subsidence, Gravity anomalies, Seismic reflection, Profiles, Barents Sea

## 53-1540

Integrated geophysical analysis supporting the impact origin of the Mjølner structure, Barents Sea.

Tsikalas, F., Gudlaugsson, S.T., Eldholm, O., Faleide, J.I., *Tectonophysics*, Apr. 30, 1998, 289(4), p.257-280, 58 refs.

Marine geology, Subpolar regions, Geophysical surveys, Ocean bottom, Bottom topography, Impact, Gravity anomalies, Magnetic anomalies, Seismic velocity, Geomagnetism, Theories, Origin, Barents Sea

## 53-1541

Application of light hydrocarbons (C<sub>4</sub>-C<sub>13</sub>) to oil source rock correlations: a study of the light hydrocarbon compositions of source rocks and test fluids from offshore Mid-Norway.

Odden, W., Patience, R.L., Van Graas, G.W., *Organic geochemistry*, 1998, 28(12), p.823-847, 52 refs.

Marine geology, Hydrocarbons, Origin, Sediments, Subpolar regions, Reservoirs, Lithology, Isotope analysis, Geochemistry, Stratigraphy, Statistical analysis, Sampling, Norway

## 53-1542

Observations and numerical simulations of the origin and development of very large snowflakes.

Lawson, R.P., Stewart, R.E., Angus, L.J., *Journal of the atmospheric sciences*, Nov. 1, 1998, 55(21), p.3209-3229, 64 refs.

Precipitation (meteorology), Storms, Falling snow, Snowflakes, Dendritic ice, Snow crystal growth, Snow air interface, Convection, Aggregates, Probes, Profiles, Simulation

## 53-1543

Numerical study of aircraft wake induced ice cloud formation.

Gierens, K.M., Ström, J., *Journal of the atmospheric sciences*, Nov. 1, 1998, 55(21), p.3253-3263, 28 refs.

Climatology, Cloud physics, Condensation trails, Aerosols, Haze, Freezing rate, Ice crystal growth, Homogeneous nucleation, Water content, Upwelling, Ice vapor interface, Mathematical models

## 53-1544

Parameterizations of reflectance and effective emittance for satellite remote sensing of cloud properties.

Minnis, P., Garber, D.P., Young, D.F., Arduini, R.F., Takano, Y., *Journal of the atmospheric sciences*, Nov. 15, 1998, 55(22), p.3313-3339, 33 refs.

Climatology, Cloud physics, Cloud droplets, Spaceborne photography, Infrared radiation, Optical properties, Reflectivity, Radiance, Particle size distribution, Ice crystal optics, Ice detection, Ice temperature, Simulation

## 53-1545

**New version of hydrometeor videonde for cirrus cloud observations.**

Orikasa, N., Murakami, M., *Meteorological Society of Japan. Journal*, Dec. 1997, 75(6), p.1033-1039, With Japanese summary. 8 refs.

Precipitation (meteorology), Cloud physics, Ice detection, Ice crystal size, Ice crystal structure, Particle size distribution, Sounding, Photography, Ice detection, Design, Performance, Meteorological instruments

## 53-1546

**Study on a wind field when a cold air flow that causes snowfall around Sapporo.**

Nakayama, K., Hasegawa, K., Fujita, M., *Journal of hydroscience and hydraulic engineering*, May 1998, 16(1), p.9-25, 15 refs.

Climatology, Cloud physics, Precipitation (meteorology), Snowfall, Surface temperature, Temperature variations, Convection, Wind velocity, Unsteady flow, Radio echo soundings, Profiles, Forecasting, Analysis (mathematics), Japan—Sapporo

## 53-1547

**Control of road surface temperature and thermal energy storage using a bore-hole heat exchange system.**

Ohki, M., Watanabe, H., Fukuhara, T., Moriyama, K., *Journal of hydroscience and hydraulic engineering*, May 1998, 16(1), p.41-48, 4 refs.

Road icing, Winter maintenance, Heat pumps, Snow removal, Ice control, Snow melting, Heat transfer, Surface temperature, Temperature control, Bore-holes, Pipe flow, Geothermal thawing, Performance

## 53-1548

**Baltica-Laurentia connection: Sveconorwegian (Grenvillian) metamorphism, cooling, and unroofing in the Bamble Sector, Norway.**

Cosca, M.A., Mezger, K., Essene, E.J., *Journal of geology*, Sep. 1998, 106(5), p.539-552, 73 refs.

Pleistocene, Tectonics, Earth crust, Subpolar regions, Geological surveys, Mineralogy, Radioactive age determination, Lithology, Sampling, Geochronology, Thermal analysis, Norway

## 53-1549

**Tectonic significance of the Fen Province, S. Norway: constraints from geochronology and paleomagnetism.**

Meert, J.G., Torsvik, T.H., Eide, E.A., Dahlgren, S., *Journal of geology*, Sep. 1998, 106(5), p.553-564, 45 refs.

Pleistocene, Tectonics, Subpolar regions, Earth crust, Continental drift, Magma, Geomagnetism, Orientation, Rock properties, Radioactive isotopes, Radioactive age determination, Geochronology, Theories, Norway—Fen Province

## 53-1550

**616 Ma Old Egersund Basaltic dike swarm, SW Norway, and Late Neoproterozoic opening of the Iapetus ocean.**

Bingen, B., Demaiffe, D., Van Breemen, O., *Journal of geology*, Sep. 1998, 106(5), p.565-574, 48 refs.

Pleistocene, Subpolar regions, Tectonics, Earth crust, Continental drift, Magma, Geologic processes, Classifications, Geochemistry, Radioactive isotopes, Radioactive age determination, Geochronology, Norway

## 53-1551

**Anomalously low temperature orthopyroxene, spinel, and sapphirine occurrences in metasediments from the Bamble amphibolite-to-granulite facies transition zone (south Norway): possible evidence for localized action of saline fluids.**

Nijland, T.G., Louret, J.L.R., Visser, D., *Journal of geology*, Sep. 1998, 106(5), p.575-590, 62 refs.

Pleistocene, Tectonics, Subpolar regions, Earth crust, Geologic processes, Fluid dynamics, Hydrothermal processes, Ice melting, Brines, Rock properties, Mineralogy, Chemical analysis, Norway

## 53-1552

**Effects of evaporator frosting on the performance of an air-to-air heat pump.**

Martinez-Frias, J., Aceves, S.M., ASME International Mechanical Engineering Congress and Exposition, Dallas, TX, Nov. 16-21, 1997. ASME Advanced Energy Systems Division, Proceedings. Edited by M.L. Ramalingam et al and AES Vol.37, New York, American Society of Mechanical Engineers, 1997, p.357-363, 24 refs.

DLC TJ163.7.P762 1997

Heat pumps, Performance, Plates, Ice sublimation, Air flow, Frost, Ice formation, Ice solid interface, Ice cover thickness, Heat transfer coefficient, Mathematical models, Frost forecasting

## 53-1553

**Feasibility study on using cooling capacitance from ice storage system to save energy costs of operating chiller AC system.**

Li, S.S., ASME International Mechanical Engineering Congress and Exposition, Dallas, TX, Nov. 16-21, 1997. ASME Advanced Energy Systems Division, Proceedings. Edited by M.L. Ramalingam et al and AES Vol.37, New York, American Society of Mechanical Engineers, 1997, p.365-370, 5 refs.

DLC TJ163.7.P762 1997

Air conditioning, Cooling systems, Electric power, Heat recovery, Ice makers, Performance, Cost analysis, Thermal analysis, Temperature control, Analysis (mathematics)

## 53-1554

**Principal climatic cycles of Holocene. [O glavnykh klimaticheskikh ritmakh golotsena]**

Klimenko, V.V., *Rossiiskaia akademiia nauk. Doklady*, Nov. 1997, 357(3), p.399-402, In Russian. 15 refs.

Pleistocene, Paleoclimatology, Climatic changes, Global change, Ice cover effect, Air temperature, Spectra, Temperature variations

## 53-1555

**Perennial global changes of the marine biota in the Arctic (in the Kara and White Seas). [Mnogoletnie kolebania elementov morskoi bioty v priark-ticheskikh regionakh (na primere Belogo i Karskogo more&i)]**

Vozzhinskai, V.B., Vinogradov, G.M., Kuzin, V.S., Kryzhov, V.N., *Rossiiskaia akademiia nauk. Doklady*, Nov. 1997, 357(3), p.403-405, In Russian. 11 refs.

Subpolar regions, Marine biology, Ecology, Biomass, Plankton, Air temperature, Temperature variations, Climatic changes, Russia—Kara Sea, Russia—White Sea

## 53-1556

**Nivation forms and processes in unconsolidated sediments, NE Greenland.**

Christiansen, H.H., *Earth surface processes and landforms*, Aug. 1998, 23(8), p.751-760, 21 refs. Geomorphology, Subpolar regions, Active layer, Periglacial processes, Landforms, Nivation, Ablation, Soil erosion, Sediment transport, Solifluction, Models, Greenland

## 53-1557

**Power law or power flaw?**

Pattyn, F., Van Huele, W., *Earth surface processes and landforms*, Aug. 1998, 23(8), p.761-767, 12 refs. Geomorphology, Glacial geology, Glacial erosion, Valleys, Profiles, Physical properties, Statistical analysis, Simulation, Analysis (mathematics)

## 53-1558

**Bottom buoyancy layer in an ice-covered lake.**

Malm, J., *Water resources research*, Nov. 1998, 34(11), p.2981-2993, 33 refs.

Limnology, Subpolar regions, Icebound lakes, Bottom sediment, Water temperature, Stratification, Boundary layer, Advection, Salinity, Buoyancy, Thermal diffusion, Mathematical models, Ice cover effect, Russia—Karelia

## 53-1559

**Importance of biogeochemical processes in modeling stream chemistry in two watersheds in the Sierra Nevada, California.**

Meixner, T., Brown, A., Bales, R.C., *Water resources research*, Nov. 1998, 34(11), p.3121-3133, 40 refs.

Watersheds, Alpine landscapes, Limnology, Stream flow, Runoff, Snow hydrology, Snowmelt, Bedrock, Weathering, Hydrogeochemistry, Ion density (concentration), Sampling, Models, Geochemical cycles, United States—California—Sierra Nevada

## 53-1560

**Wind-driven, coastal-trapped waves off the island of Gotland, Baltic Sea.**

Pizarro, O., Shaffer, G., *Journal of physical oceanography*, Nov. 1998, 28(11), p.2117-2129, 24 refs.

Oceanography, Subpolar regions, Ocean currents, Ocean waves, Oscillations, Turbulent exchange, Air water interactions, Wind factors, Hydrography, Topographic effects, Wave propagation, Models, Profiles, Baltic Sea

## 53-1561

**New sea spray generation function for wind speeds up to 32 m s<sup>-1</sup>.**

Andreas, E.L., MP 5254, *Journal of physical oceanography*, Nov. 1998, 28(11), p.2175-2184, 62 refs.

Oceanography, Sea spray, Aerosols, Bubbles, Drops (liquids), Turbulent boundary layer, Wind velocity, Air water interactions, Heat flux, Moisture transfer, Latent heat, Mathematical models

The sea spray generation function quantifies the rate at which spray droplets of a given size are produced at the sea surface. As such, it is important in studies of the marine aerosol and its optical properties and in understanding the role that sea spray plays in transferring heat and moisture across the air-sea interface. The emphasis here is on this latter topic, where uncertainty over the spray generation function, especially in high winds, is a major obstacle. This paper surveys the spray generation functions available in the literature and, on theoretical grounds, focuses on one by M.H. Smith et al. that has some desirable properties but does not cover a wide enough droplet size range to be immediately useful for quantifying spray heat transfer. With reasonable modifications and extrapolations, however, the paper casts the Smith function into a new form that can be used to predict the production of sea spray droplets with radii from 2 to 500  $\mu\text{m}$  for 10 m winds from 0 to 32.5 m/s. The paper closes with sample calculations of the sensible and latent heat fluxes carried by spray that are based on this new spray generation function.

## 53-1562

**Cloud detection over the arctic region using airborne imaging spectrometer data during the daytime.**

Gao, B.C., Han, W., Tsay, S.C., Larsen, N.F., *Journal of applied meteorology*, Nov. 1998, 37(11), p.1421-1429, 24 refs.

Remote sensing, Spaceborne photography, Spectroscopy, Radiance, Polar atmospheres, Cloud cover, Detection, Water vapor, Radiation absorption, Snow cover effect, Ice cover effect, Spectra, Resolution, United States—Alaska

## 53-1563

**Dual-wavelength radar method to measure snowfall rate.**

Matrosov, S.Y., *Journal of applied meteorology*, Nov. 1998, 37(11), p.1510-1521, 19 refs.

Precipitation (meteorology), Snowfall, Snowflakes, Snow crystals, Spectra, Indexes (ratios), Sounding, Radar echoes, Reflectivity, Backscattering, Statistical analysis, Forecasting, Meteorological instruments

## 53-1564

**Comparison of seasonal changes in phytoplankton in different zones of the Antarctic.**

Rat'kova, T.N., *Russian journal of aquatic ecology*, Dec. 1997, 6(1-2), p.13-23, Translated from Zhurnal vodnoi ekologii. With Russian summary. 65 refs.

Marine biology, Biomass, Plankton, Ecosystems, Nutrient cycle, Photosynthesis, Chlorophylls, Light effects, Ice cover effect, Sampling, Profiles, Seasonal variations, Antarctica—Admiralty Bay

53-1565

Seasonal changes of nearshore antarctic phytoplankton and abiotic factors in the Admiralty Bay, King George Island, South Shetland Islands.

Zernova, V.V., Domanov, M.M., *Russian journal of aquatic ecology*, Dec. 1997, 6(1-2), p.25-34, Translated from Zhurnal vodnoi ekologii. With Russian summary. 47 refs.

Marine biology, Biomass, Plankton, Ice edge, Classifications, Water chemistry, Organic nuclei, Chlorophylls, Sampling, Seasonal variations, Statistical analysis, Antarctica—Admiralty Bay

53-1566

Response of zooplankton communities to acidification in lakes of northern Russia.

Lazareva, V.I., *Russian journal of ecology*, July 1995, 4(1), p.41-54, Translated from Zhurnal vodnoi ekologii. With Russian summary. 26 refs.

Limnology, Subpolar regions, Microbiology, Water chemistry, Chemical properties, Biomass, Plankton, Ecosystems, Classifications, Statistical analysis, Sampling, Russia—Karelia

53-1567

Integration of remote sensed and in-situ data in an analysis of the air pollution effects of terrestrial ecosystems in the border areas between Norway and Russia.

Tømmervik, H., Johansen, M.E., Pedersen, J.P., Guneriusen, T., *Environmental monitoring and assessment*, Jan. 1998, 49(1), p.51-85, Refs. p.82-85.

Climatology, Subpolar regions, Atmospheric boundary layer, Air pollution, Aerosols, Forest ecosystems, Landscape types, Lichens, Environmental tests, Remote sensing, Geophysical surveys, Sampling, Correlation, Russia, Norway

53-1568

Flexural properties of steel fiber-reinforced concretes at low temperature.

Pigeon, M., Cantin, R., *Cement & concrete composites*, Oct. 1998, 20(5), p.365-375, 8 refs.

Concrete strength, Reinforced concretes, Composite materials, Concrete aggregates, Mechanical properties, Ice formation, Capillary ice, Low temperature tests, Mechanical tests, Flexural strength, Tensile properties, Temperature effects

53-1569

Impact resistance of fiber reinforced concrete at subnormal temperatures.

Banthia, N., Yan, C., Sakai, K., *Cement & concrete composites*, Oct. 1998, 20(5), p.393-404, 19 refs.

Concrete strength, Reinforced concretes, Composite materials, Mortars, Impact tests, Dynamic loads, Flexural strength, Low temperature tests, Temperature effects

53-1570

Adrift on the ice pack, researchers explore changes in the arctic environment.

Levi, B.G., *Physics today*, Nov. 1998, 51(11), p.17-19, 10 refs.

Climatology, Polar atmospheres, Atmospheric composition, Climatic changes, Atmospheric circulation, Drift stations, Ice cover thickness, Research projects, Environmental tests, Arctic Ocean

53-1571

Relationship between soft bottom macrofauna and polycyclic aromatic hydrocarbons (PAH) from smelter discharge in Norwegian fjords and coastal waters.

Oug, E., Næs, K., Rygg, B., *Marine ecology progress series*, Nov. 12, 1998, Vol.173, p.39-52, 37 refs.

Oceanography, Subpolar regions, Water pollution, Ocean bottom, Biomass, Ecosystems, Hydrocarbons, Metals, Waste disposal, Bottom sediment, Sampling, Statistical analysis, Environmental impact, Norway

53-1572

Phytoplankton carbon isotope fractionation during a diatom spring bloom in a Norwegian fjord.

Kukert, H., Riebesell, U., *Marine ecology progress series*, Nov. 12, 1998, Vol.173, p.127-137, 60 refs.

Marine biology, Subpolar regions, Biomass, Photosynthesis, Plankton, Ecology, Carbon isotopes, Carbon dioxide, Suspended sediments, Chlorophylls, Advection, Sampling, Statistical analysis, Norway

53-1573

Changes in lipid composition of the antarctic krill *Euphausia superba* in the Indian sector of the antarctic ocean: influence of geographic location, sexual maturity stage and distribution among organs.

Mayzaud, P., Albessard, E., Cuzin-Roudy, J., *Marine ecology progress series*, Nov. 12, 1998, Vol.173, p.149-162, 68 refs.

Marine biology, Ecology, Plankton, Biomass, Nutrient cycle, Growth, Chemical composition, Seasonal variations, Distribution, Sampling, Statistical analysis, Indian Ocean

53-1574

Benthic mineralization and exchange in arctic sediments (Svalbard, Norway).

Glud, R.N., Holby, O., Hoffmann, F., Canfield, D.E., *Marine ecology progress series*, Nov. 12, 1998, Vol.173, p.237-251, 66 refs.

Marine biology, Marine geology, Ocean bottom, Biomass, Ecosystems, Bottom sediment, Sedimentation, Minerals, Diagenesis, Geochemical cycles, Drill core analysis, Profiles, Norway—Svalbard

53-1575

Coupling of a high-resolution atmospheric model and an ocean model for the Baltic Sea.

Gustafsson, N., Nyberg, L., Omstedt, A., *Monthly weather review*, Nov. 1998, 126(11), p.2822-2846, 19 refs.

Climatology, Weather forecasting, Marine meteorology, Atmospheric boundary layer, Synoptic meteorology, Subpolar regions, Surface temperature, Heat flux, Sea ice distribution, Ice edge, Simulation, Air ice water interaction, Baltic Sea

53-1576

March 1987 cyclone (blizzard) over the eastern Mediterranean and Balkan region associated with blocking.

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Climatology, Snowstorms, Snow accumulation, Turbulent boundary layer, Air temperature, Synoptic meteorology, Fronts (meteorology), Atmospheric circulation, Models, Weather forecasting, Turkey, Mediterranean Sea

53-1577

Natural zones in the north of Russia at the Holocene climatic optimum. [Prirodnye zony severa Rossii vo vremia klimaticheskogo optimuma golotsena]

Serebriannyi, L.R., Khropov, A.G., *Rossiiskaia akademiia nauk. Doklady*, Dec. 1997, 357(6), p.826-827, In Russian. 15 refs.

Terrain identification, Landscape types, Paleoclimatology, Tundra terrain, Taiga, Russia

53-1578

Pollen proxy data from the Nordic countries.

Berglund, B.E., European Science Foundation. Workshop on European Palaeoclimate and Man, 1st, Arles sur Rhône, France, Dec. 14-16, 1989. Evaluation of climate proxy data in relation to the European Holocene. Edited by B. Frenzel, A. Pons and B. Gläzer and Akademie der Wissenschaften und der Literatur. Paläoklimaforschung. Vol.6, Stuttgart, Gustav Fischer Verlag, 1991, p.30-36, With French summary. 6 refs.

DLC QC884.E94 1991

Paleoecology, Palynology, Quaternary deposits, Pollen, Distribution, Subpolar regions, Sampling, Statistical analysis, Mapping, Norway, Denmark, Finland, Sweden

53-1579

Opportunities for dendroclimatological research in Fennoscandia.

Eronen, M., Huttunen, P., Zetterberg, P., European Science Foundation. Workshop on European Palaeoclimate and Man, 1st, Arles sur Rhône, France, Dec. 14-16, 1989. Evaluation of climate proxy data in relation to the European Holocene. Edited by B. Frenzel, A. Pons and B. Gläzer and Akademie der Wissenschaften und der Literatur. Paläoklimaforschung. Vol.6, Stuttgart, Gustav Fischer Verlag, 1991, p.81-92, With German summary. 26 refs.

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Paleoclimatology, Climatic changes, Paleoecology, Trees (plants), Forest lines, Subpolar regions, Carbon isotopes, Radioactive age determination, Geochronology, Research projects, Statistical analysis, Finland, Sweden

53-1580

Tree-rings in Switzerland and other mountain regions: Late Glacial through Holocene.

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DLC QC884.E94 1991

Paleoclimatology, Climatic changes, Subpolar regions, Paleoecology, Trees (plants), Plant tissues, Geochronology, Vegetation patterns, Radioactive age determination, Models, Switzerland

53-1581

Glacier ice and Holocene climate.

Stauffer, B., European Science Foundation. Workshop on European Palaeoclimate and Man, 1st, Arles sur Rhône, France, Dec. 14-16, 1989. Evaluation of climate proxy data in relation to the European Holocene. Edited by B. Frenzel, A. Pons and B. Gläzer and Akademie der Wissenschaften und der Literatur. Paläoklimaforschung. Vol.6, Stuttgart, Gustav Fischer Verlag, 1991, p.191-204, With German summary. 19 refs.

DLC QC884.E94 1991

Paleoclimatology, Climatic changes, Alpine glaciation, Glacier oscillation, Sintering, Ice cores, Ice dating, Snow composition, Geochronology, Stratigraphy, Greenland, Antarctica

53-1582

Wet deposition of current-use pesticides in the Sierra Nevada mountain range, California, USA.

McConnell, L.L., LeNoir, J.S., Datta, S., Seiber, J.N., *Environmental toxicology and chemistry*, Oct. 1998, 17(10), p.1908-1916, 47 refs.

Air pollution, Mountains, Precipitation (meteorology), Snow composition, Snow impurities, Atmospheric circulation, Sampling, Ions, Environmental tests, Environmental impact, Spectroscopy, United States—California—Sierra Nevada

53-1583

Soil seed banks from coastal subarctic ecosystems of Bird Cove, Hudson Bay.

Staniforth, R.J., Griller, N., Lajzerowicz, C., *Écoscience*, 1998, 5(2), p.241-249, With French summary. 60 refs.

Plant ecology, Subarctic landscapes, Ecosystems, Beaches, Littoral zone, Landscape types, Soil temperature, Vegetation patterns, Classifications, Growth, Revegetation, Sampling, Canada—Manitoba—Hudson Bay

53-1584

Growth of foxtail pine seedlings at treeline in the southeastern Sierra Nevada, California, U.S.A.

Lloyd, A., *Écoscience*, 1998, 5(2), p.250-257, With French summary. 46 refs.

Plant ecology, Forest ecosystems, Alpine landscapes, Forest lines, Vegetation patterns, Altitude, Growth, Nutrient cycle, Climatic factors, Sampling, Chemical analysis, United States—California—Sierra Nevada



- 53-1585**  
Plant interactions in alpine tundra: 13 years of experimental removal of dominant species. Aksenova, A.A., Onipchenko, V.G., Blinikov, M.S., *Ecoscience*, 1998, 5(2), p.258-270, With French summary. 48 refs.  
Plant ecology, Ecosystems, Plants (botany), Alpine tundra, Tundra vegetation, Lichens, Modification, Revegetation, Experimentation, Russia—Caucasus
- 53-1586**  
Long-term destruction of subarctic wetland vegetation by lesser snow geese. Kotanen, P.M., Jefferies, R.L., *Ecoscience*, 1997, 4(2), p.179-182, With French summary. 17 refs.  
Ecosystems, Subarctic landscapes, Wetlands, Biomass, Ecology, Vegetation patterns, Degradation, Environmental impact, Environmental protection, Sampling, Revegetation, Grazing, Canada—Manitoba
- 53-1587**  
Effects of shading, nutrient application and warming on leaf growth and shoot densities of dwarf shrubs in two arctic-alpine plant communities. Graglia, E., Jonasson, S., Michelsen, A., Schmidt, I.K., *Ecoscience*, 1997, 4(2), p.191-198, With French summary. 33 refs.  
Plant ecology, Climatology, Global warming, Plants (botany), Forest lines, Arctic landscapes, Alpine landscapes, Growth, Biomass, Nutrient cycle, Light effects, Temperature effects, Simulation, Sweden—Abisko
- 53-1588**  
Demography of fine roots in response to nutrient applications in a Norway spruce stand in south-western Sweden. Majdi, H., Kangas, P., *Ecoscience*, 1997, 4(2), p.199-205, With French summary. 25 refs.  
Plant ecology, Forest ecosystems, Trees (plants), Roots, Subarctic landscapes, Nutrient cycle, Modification, Biomass, Growth, Survival, Statistical analysis, Sweden
- 53-1589**  
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Sea ice, Nuclear magnetic resonance, Brines, Measuring instruments, Ice spectroscopy, Ice composition, Ice structure, Antarctica—McMurdo Sound
- 53-1590**  
Settlement rate of lead shot in tundra wetlands. Flint, P.L., *Journal of wildlife management*, July 1998, 62(3), p.1099-1102, 14 refs.  
Ecosystems, Ecology, Biomass, Wetlands, Tundra soils, Soil mechanics, Sedimentation, Impurities, Soil pollution, Environmental impact, Sampling, Statistical analysis, United States—Alaska—Yukon-Kuskokwim Delta
- 53-1591**  
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Earth crust, Subpolar regions, Geologic structures, Minerals, Magma, Fluid dynamics, Geochemistry, Rock properties, Chemical composition, Russia—Kola Peninsula
- 53-1592**  
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Cryobiology, Ice physics, Preserving, Ice formation, Ice optics, Ice solid interface, Freezing front, Detection, Ice spectroscopy, Magnetic resonance, Imaging, Structural analysis
- 53-1593**  
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Geomorphology, Geocryology, Landforms, Pingos, Hydraulics, Classifications, Continuous permafrost, Permafrost hydrology, Canada—Northwest Territories—Mackenzie Delta, Greenland
- 53-1594**  
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- 53-1595**  
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Glaciology, Geomorphology, Glacier surveys, Extraterrestrial ice, Research projects, Organizations, International cooperation, Statistical analysis
- 53-1596**  
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- 53-1597**  
Atmospheric circulation patterns and spatial climatic variations in Beringia. Mock, C.J., Bartlein, P.J., Anderson, P.M., *International journal of climatology*, Aug. 1998, 18(10), p.1085-1104, 44 refs.  
Climatology, Climatic changes, Synoptic meteorology, Polar atmospheres, Precipitation (meteorology), Surface temperature, Atmospheric circulation, Classifications, Seasonal variations, Statistical analysis, Russia—Siberia, United States—Alaska
- 53-1598**  
Effects of winter weather conditions on soil freezing in southern Michigan. Isard, S.A., Schaetzl, R.J., *Physical geography*, Jan.-Feb. 1998, 19(1), p.71-94, Refs. p.90-94.  
Climatology, Geocryology, Soil freezing, Distribution, Soil temperature, Freeze thaw cycles, Snow accumulation, Snow cover effect, Lake effects, Frost forecasting, Seasonal variations, Mathematical models, United States—Michigan
- 53-1599**  
Improving the efficiency of road maintenance—forming an information network for road maintenance. [Iji kanri no koritsuka ni tsuite—doro iji gyomu no joho nettowaku-ka] Kodama, H., Anmi, N., Ichijo, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.61-68, In Japanese.  
Highway planning, Road maintenance, Safety, Snow removal, Data processing, Data transmission, Japan—Hokkaido
- 53-1600**  
Tree planting on road cuts. [Mokuhon o mochi ita doro homen ryokka ni tsuite] Ishizuka, T., Okada, H., Takeuchi, M., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.103-110, In Japanese. 4 refs.  
Protective vegetation, Trees (plants), Snow hedges, Snow retention, Slope protection, Soil stabilization, Road maintenance, Japan—Hokkaido
- 53-1601**  
Snow melting tank in north central Sapporo—meeting the needs for comfortable towns in the north undaunted by snow. [Sapporo-shi ni okeru toshinhoku yusetsuso no seibi ni tsuite—yuki ni tsuyoi hokkoku no kalteki na machi zukuri o motomete] Yuki, O., Taberi, A., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.157-162, In Japanese.  
Snow melting, Artificial melting, Snow disposal, Storage tanks, Underground facilities, Heat recovery, Municipal engineering, Urban planning, Japan—Hokkaido
- 53-1602**  
Using recycled concrete aggregates as a roadbed material and frost heave resistant layer. [Konkurito salsei kotsuzai o riyo shita robanzal, tojo yokuselso e no tekiyo ni tsuite] Abe, R., Takahashi, M., Ebiko, Y., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.169-174, In Japanese. 4 refs.  
Roadbeds, Subgrade soils, Frost heave, Concrete aggregates, Soil stabilization, Frost resistance, Frost protection, Subgrade preparation, Road maintenance, Japan—Hokkaido
- 53-1603**  
Studies on snowplows—studies on improving snow removal efficiency at designated sites. [Josetsu kikai ni kansuru chosa—tokutei kasho josetsu no koritsuka ni kansuru chosa] Hokkaido Development Bureau, *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb. 97), 40(1), p.255-274, In Japanese.  
Motor vehicles, Tires, Snow removal equipment, Road maintenance
- 53-1604**  
Performance tests on the next generation (2D-2D-4D-4D) snowplow truck—interim report. [Jisedai josetsu torakku (2D-2D-4D-4D) selno shiken—chukan hokoku] Saitoh, T., Watanabe, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.277-284, In Japanese.  
Snow removal equipment, Motor vehicles, Specifications, Design criteria, Cold weather tests, Road maintenance
- 53-1605**  
Development of a shear pinless device for a compact snowplow—interim report. [Kogata josetsusha shapinresu sochi no kaihatsu ni tsuite—chukan hokoku] Tanimoto, N., Usami, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.285-290, In Japanese.  
Snow removal equipment, Motor vehicles, Road maintenance
- 53-1606**  
Ultrahard bit cutting edge. [Choko bitto katingu edji ni tsuite] Yamaguchi, H., Makino, M., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries)*, 1996(Pub. Feb.97), 40(1), p.291-298, In Japanese.  
Snow removal equipment, Motor vehicles, Road maintenance

53-1607

Development of simple deicer spreaders. [Toketsu boshizai kani sanpu sochi kaihatu ni tsuite] Einaga, T., Kudoh, S., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(1), p.299-304, In Japanese.

Road icing, Chemical ice prevention, Salting, Motor vehicles, Snow removal equipment, Road maintenance

53-1608

Development of a road snow removal information system. [Doro josetsu joho shisutemu no kaihatu ni tsuite]

Aoshima, N., Sawada, T., Kinoshita, S., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(1), p.305-312, In Japanese.

Road icing, Weather forecasting, Warning systems, Safety, Snow removal, Data transmission, Road maintenance, Japan—Hokkaido

53-1609

Kokufu snowbreak forest outside of Nakagawa on National Highway 40—report on completion of the Kokufu snowbreak forest project. [Ippan kokudo 40-go Nakagawa-machi Kokufu bosetsurin—Kokufu bosetsurin no koji kanzen hokoku]

Hashimoto, M., Ueda, K., Harada, K., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.45-52, In Japanese. 4 refs.

Blowing snow, Snowdrifts, Snow retention, Snow hedges, Protective vegetation, Forest strips, Road maintenance, Japan—Hokkaido

53-1610

Current results and future problems of the Asahikawa municipal snow removal drains. [Asahikawa-shi ryusetsuko no seibi koka to kongo no kadai ni tsuite]

Takada, R., Suzuki, Y., Shimada, T., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.53-60, In Japanese. 2 refs.

Snow removal, Drains, Water pipes, Channels (waterways), Municipal engineering, Road maintenance, Japan—Hokkaido

53-1611

Study on the surface characteristics of winter traffic congestion in Sapporo based on aerial photographs. [Koku shashin ni motozuku Sapporo shinai ni okeru toki kotsu konzatsu no menteki tokusei ni kansuru kosatsu]

Shimojo, A., Takagi, H., Azuta, Y., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.75-80, In Japanese.

Aerial surveys, Urban planning, Safety, Cold weather operation, Road maintenance, Japan—Hokkaido

53-1612

Reduction (of replacement depth) as a frost heave countermeasure in the raised ground part—suggestions from on-site frost heave tests. [Moritsuchi-bu ni okeru toji taisaku (chikan fukasa) no teigen ni tsuite—genba toji shiken kara no teigen]

Tanaka, Y., Takeda, Y., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.103-108, In Japanese. 6 refs.

Subgrade soils, Soil freezing, Frost penetration, Frost heave, Frost protection, Ground water, Water table, Drainage, Soil stabilization, Road maintenance

53-1613

Report on avalanche countermeasures in the Bihiro Pass—procedures in handling explosives. [Bihiro-toge no nadare taisaku hokoku—kayaku o shiyo shita shori sagyo ni tsuite]

Hirose, A., Matsuura, T., Tokairin, K., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.121-126, In Japanese.

Avalanche triggering, Explosives, Blasting, Safety, Road maintenance, Japan—Hokkaido

53-1614

Comparing the conditions of all the road surfaces over two winters based on a new road surface classification. [Shin romen bunrui ni motozuku 2 toki no zen-doromen jokyō no hikaku]

Kaneko, M., Kajiya, Y., Matsuzawa, M., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.127-132, In Japanese. 3 refs.

Road icing, Snowfall, Snow removal, Skid resistance, Safety, Highway planning, Road maintenance, Japan—Hokkaido

53-1615

Analysis of the current level of road maintenance on the main highways. [Kansen doro ni okeru toki doro kanri suljun no genjo bunseki ni tsuite]

Mima, H., Takagi, H., Kawamura, K., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.133-140, In Japanese. 4 refs.

Road icing, Snow removal, Skid resistance, Safety, Highway planning, Road maintenance, Japan—Hokkaido

53-1616

Road maintenance in winter around Sapporo—report on using examples from road icing forecasts for snow removal. [Sapporo-ken ni okeru tokikan no doro kanri shuho ni tsuite—josetsu, romen toketsu yosoku joho o katsuyo shita jirei hokoku]

Nemori, K., Kajiya, Y., Matsuzawa, M., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.141-146, In Japanese. 1 ref.

Road icing, Weather forecasting, Frost forecasting, Snow removal, Road maintenance, Japan—Hokkaido

53-1617

Study on road icing detection by near infrared optical absorption images. [Kin-sekigai ko-kyushu gazo o mochi ita romen toketsu kenchi ni kansuru kenkyu]

Nami, M., Nagao, S., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.147-152, In Japanese. 4 refs.

Road icing, Ice detection, Ice optics, Infrared photography, Road maintenance

53-1618

Study on the results of deicer spreading on icy roads. [Seppyo romen ni okeru toketsu boshizai-to sanpu koka ni kansuru kenkyu]

Oikawa, S., Takagi, H., Kawamura, K., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.153-160, In Japanese. 4 refs.

Road icing, Chemical ice prevention, Salting, Sanding, Skid resistance, Road maintenance, Japan—Hokkaido

53-1619

Evaluating the applicability of frost resistant pavements—interim report on uniform test pavements. [Toketsu yokusei hoso no kyooyosei hyoka ni tsuite—toitsu shiken hoso ni okeru chukan hokoku]

Shitamichi, J., Takahashi, M., Oguri, M., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.161-166, In Japanese. 3 refs.

Road icing, Pavements, Frost resistance, Frost protection, Cold weather tests, Road maintenance, Japan—Hokkaido

53-1620

Impact of ITS on highway traffic and regional society in Hokkaido—state of the art of research and development from a questionnaire survey to knowledgeable persons. [ITS ga Hokkaido no doro kotsu, chiiki shakai ni ataeru inpakuto ni tsuite—kenkyu kaihatu no genjo to yushikisha anketo chosa no kekka kara]

Kajiya, Y., Fukuzawa, Y., Kumazawa, Y., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.167-174, In Japanese. 5 refs.

Highway planning, Road maintenance, Weather forecasting, Warning systems, Safety, Cold weather operation, Data transmission, Computer applications, Japan—Hokkaido

53-1621

Using the Internet to provide road information—experimental transmission of images of mountain passes. [Intanetto o katsuyo shita doro joho teikyo ni tsuite—toge gazo no denso jikken]

Kumazawa, Y., Kajiya, Y., Chiba, T., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.175-184, In Japanese. 1 ref.

Highway planning, Road maintenance, Weather forecasting, Warning systems, Safety, Cold weather operation, Data transmission, Computer applications, Japan—Hokkaido

53-1622

Problems in designing earthquake resistant bridges in cold regions based on records of strong earthquakes. [Kyoshin kiroku ni motozuku kanrei chiiki ni okeru menshinkyo sekkei no kadai ni tsuite]

Kobayashi, M., Ohta, K., Tanimoto, T., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.189-194, In Japanese.

Earthquakes, Bridges, Piers, Foundations, Supports, Rubber, Damping, Low temperature tests, Cold weather performance, Frost resistance, Structural analysis, Japan—Hokkaido

53-1623

Construction design and construction report of the Shungaku Bridge deck. [Shungakkyo jobu kasetsu koji no shiko keikaku to koji hokoku ni tsuite]

Nakajima, S., Ono, T., Yano, S., *Hokkaido kaihatu kyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(2), p.229-236, In Japanese. 4 refs.

Bridges, Concrete structures, Cold weather construction, Snow loads, Snow removal, Road maintenance, Japan—Hokkaido

53-1624

Llandoverly seculicollactinae and rotasphaeridae (radiolaria) from the Cape Phillips formation, Cornwallis Island, arctic Canada.

MacDonald, E.W., *Journal of paleontology*, July 1998, 72(4), p.585-604, 32 refs.  
Pleistocene, Paleocology, Geological surveys, Subpolar regions, Lithology, Fossils, Classifications, Sampling, Structural analysis, Scanning electron microscopy, Canada—Northwest Territories—Cornwallis Island

53-1625

Systematics of the acanthoparyphinae (Trilobita), with species from the Silurian of arctic Canada.

Adrain, J.M., *Journal of paleontology*, July 1998, 72(4), p.698-718, 58 refs.  
Pleistocene, Paleocology, Fossils, Subpolar regions, Lithology, Stratigraphy, Classifications, Structural analysis, Sampling, Biogeography, Statistical analysis, Canada—Northwest Territories—Phillips, Cape

53-1626

Physical and chemical limnology of northern boreal lakes, Wood Buffalo National Park, northern Alberta and the Northwest Territories, Canada.

Moser, K.A., Smol, J.P., Lean, D.R.S., MacDonald, G.M., *Hydrobiologia*, 1998, Vol.377, p.25-43, 67 refs.

Limnology, Subarctic landscapes, Lake water, Vegetation patterns, Classifications, Hydrogeochemistry, Muskeg, Sampling, Ion density (concentration), Statistical analysis, Canada—Northwest Territories—Wood Buffalo National Park, Canada—Alberta

53-1627

Hybrid modeling in meteorological applications: anatomy of a \$200 million freeze.

Reiter, E.R., Teixeira, L., Shen, R.J., Martsolf, J.D., Spyke, P.D., Townsend, C., *Meteorology and atmospheric physics*, 1998, 67(1-4), p.239-248, 7 refs.  
Agriculture, Weather forecasting, Frost forecasting, Humidity, Surface temperature, Freezing points, Damage, Models, Computerized simulation, Accuracy, United States—Florida

53-1628

In search of polar warming.

Radok, U., Brown, T., *Meteorology and atmospheric physics*, 1998, 67(1-4), p.249-252, 6 refs.  
Climatology, Climatic changes, Polar atmospheres, Greenhouse effect, Global warming, Detection, Wind velocity, Temperature variations, Statistical analysis, Indexes (ratios), Forecasting

53-1629

Horizontal meridional thermospheric winds over King George Island, Antarctica, during the June 1991 geomagnetic storm.

Arriagada, M.A., Foppiano, A.J., Buonsanto, M.J., *Journal of atmospheric and solar-terrestrial physics*, July 1998, 60(10), p.1007-1012, 35 refs.  
Geomagnetism, Atmospheric physics, Electric fields, Particles, Thermal expansion, Storms, Polar atmospheres, Wind direction, Sounding, Diurnal variations, Models, Antarctica—King George Island

53-1630

Possible role of disturbance in shaping the northern distribution of *Pinus resinosa*.

Flannigan, M.D., Bergeron, Y., *Journal of vegetation science*, Aug. 1998, 9(4), p.477-482, 46 refs.  
Phenology, Forest ecosystems, Plant ecology, Forest lines, Vegetation patterns, Distribution, Forest fires, Climatic factors, Damage, Environmental impact, Simulation, Theories, Canada—Quebec

53-1631

Biomass and chemical composition of common forest plants in response to fire in western Norway.

Skre, O., Wielgolaski, F.E., Moe, B., *Journal of vegetation science*, Aug. 1998, 9(4), p.501-510, 42 refs.  
Plant ecology, Forest ecosystems, Subarctic landscapes, Forest fires, Biomass, Plant tissues, Chemical composition, Organic soils, Damage, Revegetation, Sampling, Statistical analysis, Environmental impact, Norway

53-1632

Seedling establishment in relation to microhabitat variation in a windthrow gap in a boreal *Pinus sylvestris* forest.

Kuuluvainen, T., Juntunen, P., *Journal of vegetation science*, Aug. 1998, 9(4), p.551-562, 51 refs.  
Plant ecology, Forest ecosystems, Subarctic landscapes, Forest canopy, Litter, Decomposition, Revegetation, Growth, Vegetation patterns, Topographic effects, Sampling, Finland

53-1633

Structure of a pristine *Picea abies* forest in north-eastern Europe.

Kuuluvainen, T., Syrjänen, K., Kalliola, R., *Journal of vegetation science*, Aug. 1998, 9(4), p.563-574, 57 refs.  
Plant ecology, Forest ecosystems, Arctic landscapes, Taiga, Forest canopy, Revegetation, Litter, Decomposition, Vegetation patterns, Biomass, Classifications, Statistical analysis, Sampling, Russia—Pechora River

53-1634

Successional trends 219 years after fire in an old *Pinus sylvestris* stand in northern Sweden.

Engelmark, O., Hofgaard, A., Arnborg, T., *Journal of vegetation science*, Aug. 1998, 9(4), p.583-592, 57 refs.

Plant ecology, Forest ecosystems, Arctic landscapes, Revegetation, Vegetation patterns, Forest fires, Damage, Sampling, Age determination, Sweden

53-1635

Historical Soviet daily snow depth, volume 1: 1881-1985.

National Snow and Ice Data Center. Cooperative Institute for Research in Environmental Sciences, Boulder, National Snow and Ice Data Center, 1994, n.p., CD-ROM. Contains ASCII text data files and a PostScript file of a map of 284 World Meteorological Organization stations.

Snow depth, Snow surveys, Data processing, CIS

53-1636

Estimation of methane emission under global warming. [K otsenke emissii metana pri global'nom poteplenii]

Velichko, A.A., Borisova, O.K., Zelikson, E.M., Kremetskii, K.V., Nechaev, V.P., *Rossiiskaia akademiia nauk. Doklady*, Sep. 1997, 356(3), p.387-389, 15 refs.

Global warming, Natural gas, Tundra, Forest tundra, Swamps, Paleoclimatology, Climatic factors, Precipitation (meteorology), Pleistocene

53-1637

Permafrost evolution during Pleistocene-Holocene history of Urengoy field of West Siberia. [Kriolitozona v pleistotsen-golotsenovoi istorii Urengoi'skogo raiona Zapadnoi Sibiri]

Galushkin, I.U.I., Lopatin, N.V., *Rossiiskaia akademiia nauk. Doklady*, Sep. 1997, 356(3), p.393-397, 15 refs.

Permafrost origin, Pleistocene, Paleoclimatology, Computerized simulation, Models, Russia—Siberia

53-1638

Advection of unusual warm Atlantic water into the Arctic Basin. [Postuplenie neobychno teplykh atlanticheskikh vod v Arkticheski bassein]

Alekseev, G.V., Bujatov, L.V., Zakharov, V.F., Ivanov, V.V., *Rossiiskaia akademiia nauk. Doklady*, Sep. 1997, 356(3), p.401-403, 12 refs.  
Oceanography, Sea water, Water temperature, Ocean currents, Temperature variations, Arctic Ocean

53-1639

Antarctic ozone hole.

Shanklin, J., Cambridge, UK, British Antarctic Survey, 1998, 10p.

Manuals, Ozone, Meteorological data, Climatic factors, Seasonal variations, Atmospheric composition, Atmospheric circulation, Meteorological instruments, Air pollution, Environmental protection, Polar atmospheres, Antarctica

53-1640

Snow on Spanish cordilleras. ERHIN Program 1994/1995. [La nieve en las cordilleras españolas. Programa ERHIN 1994/1995]

Spain. Ministerio de Medio Ambiente. Dirección General de Obras Hidráulicas y Calidad de las Aguas, Madrid, Spain, Ministerio de Medio Ambiente, 1998, 231p., In Spanish.

Mountain glaciers, Research projects, Snow accumulation, Snow cover distribution, Snow density, Snow depth, Measurement, Measuring instruments, Meteorological data, Data processing, Low temperature research, Meteorological charts, Snow surveys, Glacier surveys, Glacier mass balance, Spain

53-1641

Relationship between the population of short-necked clams and the physical environment of the fishing grounds of short-necked clams in cold regions. [Kanreichi ni okeru asari gojo no but-suri kankyo to asari no setsoku no kankel]

Akutsu, T., Yano, K., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(4), p.175-180, In Japanese. 7 refs.

Marine biology, Animals, Ecology, Cold tolerance, Cold weather survival, Acclimatization, Japan—Hokkaido

53-1642

Windbreaks in Oinaoshi fishing port—Improving operations in cold region environments. [Oinaoshi gyoko bofu taisaku shisetsu ni tsuite—kanreichi no sagyo kankyo no kajo]

Sekiguchi, K., Nakauchi, I., Yoshihara, Y., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(4), p.205-210, In Japanese. 5 refs.

Ports, Offshore structures, Windbreaks, Wind direction, Wind velocity, Wind chill, Cold weather construction, Cold weather operation, Japan—Hokkaido

53-1643

Study on durability of asphalt mats for cold sea regions. [Kanrei kaliki-yo asufaruto matto no talkyusei ni kansuru chosa kenkyu]

Sakamoto, Y., Aveda, S., Kimura, K., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(4), p.235-240, In Japanese. 4 refs.

Offshore structures, Caissons, Composite materials, Protective coatings, Bitumens, Cold weather construction, Cold weather tests, Japan—Hokkaido

53-1644

Sea ice observation tower at Monbetsu harbor: construction of the Shinsui breakwater. [Monbetsu-ko ni okeru tenboto: Shinsui bohatel no kensetsu ni tsuite]

Satou, G., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(4), p.287-294, In Japanese.

Ports, Offshore structures, Towers, Concrete structures, Cold weather construction, Ice control, Okhotsk Sea, Japan—Hokkaido

53-1645

Study on floating structures in cold seas. [Kanrei kaliki ni okeru futal kozobutsu ni kansuru kenkyu]

Hayakawa, T., Sasajima, T., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(4), p.337-342, In Japanese. 3 refs.

Floating structures, Docks, Moorings, Ice loads, Ice control

53-1646

**Fish overwintering environment in the Shiribetsu River.** [Shiribetsu-gawa ni okeru gyo-zoku no etto kankyo ni suite]

Hata, H., Ando, M., Funaki, H., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(3), p.37-42, In Japanese.  
Animals, Ecology, Cold tolerance, Cold weather survival, Acclimatization, Phenology, Japan—Hokkaido

53-1647

**Problem of ice plates and their countermeasures in reservoirs.** [Chosuiichi no hyoban mondai to sono taisaku]

Matsuoka, S., Hideshima, Y., Onodera, Y., *Hokkaido kaihatsukyoku gijutsu kenkyu happyokai happyo gaiyoshu* (Hokkaido Development Bureau Technical Research Meeting. Presentation summaries), 1996(Pub. Feb.97), 40(3), p.283-290, In Japanese. 4 refs.

Reservoirs, Dams, Lake ice, Ice push, Ice pressure, Ice loads, Snow loads, Snow cover effect, Ice control, Japan—Hokkaido

53-1648

**Slow motion of a granular layer on an inclined plane.**

Berezin, I.U.A., Spodareva, L.A., *Journal of applied mechanics and technical physics*, Mar.-Apr. 1998(Pub. Sep.98), 39(2), p.261-264, Translated from Prikladnaia mekhanika i tekhnicheskaya fizika. 5 refs.

Fluid dynamics, Avalanche mechanics, Avalanche modeling, Shear flow, Mathematical models, Slope processes

53-1649

**Net phytoplankton in Kongsfjorden, Svalbard, July 1988, with general remarks on species composition of arctic phytoplankton.**

Hasle, G.R., Heimdal, B.R., *Polar research*, June 1998, 17(1), p.31-52, 69 refs.

Marine biology, Subpolar regions, Oceanographic surveys, Plankton, Distribution, Ecosystems, Microstructure, Biomass, Ice cover effect, Sampling, Classifications, Scanning electron microscopy, Norway—Svalbard

53-1650

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53-1652

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53-1653

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53-1655

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53-1656

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53-1657

**IRAS studies of NO<sub>2</sub>, N<sub>2</sub>O<sub>3</sub> and N<sub>2</sub>O<sub>4</sub> adsorbed on Au(111) surfaces and reactions with coadsorbed H<sub>2</sub>O.**

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53-1658

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53-1659

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53-1660

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53-1661

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53-1662

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53-1664

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53-1665

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53-1666

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53-1667

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53-1668

**Evidence of marine algae, vertebrates, and invertebrates in the erosion terrace deposits and Quaternary fluvio-glacial deposits at the Peruvian Machu Picchu Station in Antarctica.** [Evidencias de algas marinas, vertebrados e invertebrados en los depósitos de las terrazas de abrasión y depósitos fluvio-glaciares cuaternarios de la Base Peruana "Machu Picchu" en la Antártida]

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53-1669

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53-1670

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53-1678

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53-1680

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53-1681

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53-1682

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53-1683

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53-1684

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53-1685

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53-1686

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53-1687

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53-1689

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53-1690

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53-1691

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53-1692

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53-1693

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53-1694

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53-1695

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53-1696

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53-1697

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53-1698

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53-1699

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53-1701

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53-1702

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53-1703

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53-1704

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53-1705

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53-1706

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53-1707

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Climatology, Climatic changes, Glacier mass balance, Ice sheets, Ice cover thickness, Firn, Snow accumulation, Snow compaction, Snow density, Ice cores, Geodesy, Mathematical models, Greenland, Antarctica—Byrd Station

53-1708

Theoretical modeling of seismic noise propagation in firn at the South Pole, Antarctica.

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Seismology, Geophysical surveys, Snow physics, Firn, Boreholes, Sensors, Seismic refraction, Wave propagation, Attenuation, Noise (sound), Models, Theories, Countermeasures, Antarctica—Amundsen-Scott Station

The problem of interfering noise (produced by ground vehicles) on teleseismic arrivals recorded by Global Seismic Network sensors at Amundsen-Scott Station is addressed. Using the wavenumber integration method, theoretically calculated seismograms show that installing the GSN sensors in a borehole 200 to 300 m deep, 10 km away from the station, will significantly reduce the vehicle-generated noise and improve signal quality. Because the intrinsic attenuation of seismic waves propagating in the polar firn is low, most of the predicted noise reduction results from wavefront spreading, Rayleigh wave amplitude decay with depth, and from placing the sensors below the refractive waveguide that traps much of the seismic energy in the near surface layers.

53-1709

Mantle viscosity inferences from joint inversions of Pleistocene deglaciation-induced changes in geopotential with a new SLR analysis and polar wander.

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Pleistocene, Glacial geology, Glacier oscillation, Geologic structures, Viscosity, Isostasy, Continental drift, Profiles, Simulation, Spectra, Ice age theory, Antarctica, Greenland

53-1710

Estimates of ice thickness in Conamara Chaos region of Europa.

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53-1711

Conamara Chaos region, Europa: reconstruction of mobile polygonal ice blocks.

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Palmer LTER: annual season sampling on station.  
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Oceanographic surveys, Marine biology, Ecology, Seasonal variations, Hydrography, Nutrient cycle, Biomass, Sea water, Chemical analysis, Antarctica—Palmer Station
- 53-1776**  
Palmer LTER: small boat design for water column sampling.  
Smith, R.C., Quetin, L.B., Jones, J.L., Menzies, D.W., Newberger, T.A., *Antarctic journal of the United States*, 1996, 31(2), p.167-169, 2 refs.  
Oceanographic surveys, Oceanographic ships, Design, Sampling, Sea water, Measuring instruments, Recording instruments, Electronic equipment, Antarctica—Palmer Station
- 53-1777**  
Palmer LTER: open-water profiling ultraviolet radiometer albedo measurements.  
Patterson, K.W., Handley, P.L., Smith, R.C., *Antarctic journal of the United States*, 1996, 31(2), p.170-171, 8 refs.  
Oceanographic surveys, Ultraviolet radiation, Radiation measuring instruments, Radiometry, Sea water, Albedo, Brightness, Reflectivity, Antarctica—West Antarctica
- 53-1778**  
Palmer LTER: seasonal comparison of spatially averaged estimates of krill abundance.  
Lascara, C.M., *Antarctic journal of the United States*, 1996, 31(2), p.172-174, 10 refs.  
Oceanographic surveys, Marine biology, Underwater acoustics, Biomass, Seasonal variations, Antarctica—West Antarctica
- 53-1779**  
Palmer LTER: interannual variability in near surface hydrography.  
Hofmann, E.E., Lascara, C.M., Klinck, J.M., Smith, D.A., *Antarctic journal of the United States*, 1996, 31(2), p.174-176, 4 refs.  
Oceanographic surveys, Hydrography, Surface waters, Ocean currents, Periodic variations, Water temperature, Salinity, Antarctica—West Antarctica
- 53-1780**  
Palmer LTER: temporal variability in the location of the Antarctic Circumpolar Current along the west Antarctic Peninsula continental shelf.  
Klinck, J.M., *Antarctic journal of the United States*, 1996, 31(2), p.176-178, 7 refs.  
Oceanographic surveys, Ocean currents, Hydrography, Water temperature, Seasonal variations, Water flow, Antarctica—Antarctic Peninsula

53-1781

**Palmer LTER: comparison of meteorological observations from R/V Nathaniel B. Palmer to that at Palmer Station.**

Klinck, J.M., Smith, D.A., *Antarctic journal of the United States*, 1996, 31(2), p.179-181, 2 refs.  
Weather observations, Weather stations, Meteorological data, Marine meteorology, Shores, Coastal topographic features, Antarctica—Palmer Station

53-1782

**Palmer LTER: temporal variability in primary production in Arthur Harbor during the 1995-1996 growth season.**

Vernet, M., Kozlowski, W., Rosenfield, J., Greaves, A., *Antarctic journal of the United States*, 1996, 31(2), p.181-182, 6 refs.

Oceanographic surveys, Marine biology, Ice cover effect, Plant physiology, Biomass, Seasonal variations, Antarctica—Arthur Harbor

53-1783

**Palmer LTER: paleohistory of the Palmer LTER region: Palmer Deep sedimentary record.**

LoPiccolo, M., Domack, E., *Antarctic journal of the United States*, 1996, 31(2), p.183-185, 4 refs.

Glacial deposits, Marine deposits, Sediments, Paleoclimatology, Geochemistry, Magnetic properties, Radioactive age determination, Bottom sediment, Drill core analysis, Antarctica—West Antarctica

53-1784

**McMurdo Dry Valleys Long-Term Ecological Research (LTER): an overview of 1995-1996 research activities.**

Jennings-Mays, S.E., Wharton, R.A., Jr., *Antarctic journal of the United States*, 1996, 31(2), p.187-188.  
Research projects, Low temperature research, Ecology, Deserts, Ecosystems, Meteorological data, Glacier surfaces, Ablation, Slope processes, Antarctica—McMurdo Dry Valleys

53-1785

**McMurdo Dry Valleys LTER: the role of terminus cliff melt in streamflow, Taylor Valley, Antarctica.**

Lewis, K.J., Fountain, A.G., Langevin, P., *Antarctic journal of the United States*, 1996, 31(2), p.189-190, 3 refs.

Glacier melting, Stream flow, Ablation, Glacier surfaces, Meteorological data, Solar radiation, Antarctica—Taylor Valley

53-1786

**McMurdo Dry Valleys LTER: solar radiation on glaciers in Taylor Valley, Antarctica.**

Dana, G.L., Wharton, R.A., Jr., Fountain, A.G., *Antarctic journal of the United States*, 1996, 31(2), p.191-193, 5 refs.

Ice air interface, Glacier melting, Glacier surfaces, Solar radiation, Meteorological data, Albedo, Antarctica—Taylor Valley

53-1787

**McMurdo Dry Valleys LTER: spatial variation of glacier mass balance in Taylor Valley, Antarctica.**

Fountain, A.G., Lewis, K.J., Dana, G.L., *Antarctic journal of the United States*, 1996, 31(2), p.194-195, 10 refs.

Glacier mass balance, Glacier ablation, Glacier surfaces, Snow accumulation, Seasonal variations, Ice air interface, Climatic factors, Antarctica—Taylor Valley

53-1788

**McMurdo Dry Valleys LTER: stream discharge as a function of ambient temperature and incoming shortwave radiation in Taylor Valley, Antarctica.**

Moorhead, D.L., McKnight, D.M., *Antarctic journal of the United States*, 1996, 31(2), p.196-197, 9 refs.  
Stream flow, Flow rate, Ice air interface, Meteorological factors, Air temperature, Solar radiation, Glacier melting, Antarctica—Taylor Valley

53-1789

**McMurdo Dry Valleys LTER: geophysical determination of bathymetry and morphology of Taylor Valley lakes.**

Doran, P.T., Wharton, R.A., Jr., Schmok, J.P., *Antarctic journal of the United States*, 1996, 31(2), p.198-200, 4 refs.

Limnology, Geophysical surveys, Geomorphology, Sounding, Geochemistry, Topographic surveys, Mapping, Antarctica—Bonney, Lake, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake

53-1790

**McMurdo Dry Valleys LTER: characterization of protozoan communities in lakes Hoare and Fryxell using artificial substrates.**

Kepner, R.L., Jr., Wharton, R.A., Jr., *Antarctic journal of the United States*, 1996, 31(2), p.201-202, 9 refs.

Limnology, Substrates, Ecosystems, Ecology, Algae, Geochemistry, Lake water, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake

53-1791

**McMurdo Dry Valleys LTER: genetic diversity of soil nematodes in the McMurdo Dry Valleys of Antarctica.**

Courtright, E.M., Freckman, D.W., Virginia, R.A., Thomas, W.K., *Antarctic journal of the United States*, 1996, 31(2), p.203-204, 8 refs.

Soil surveys, Desert soils, Low temperature research, Ecosystems, Animals, Acclimatization, Antarctica—McMurdo Dry Valleys

53-1792

**McMurdo Dry Valleys LTER: density-driven mixing in Lake Hoare?**

Lyons, W.B., Welch, K.A., Tyler, S.W., Sharma, P., *Antarctic journal of the United States*, 1996, 31(2), p.205, 6 refs.

Limnology, Geochemistry, Ice cover effect, Water chemistry, Water structure, Salinity, Water level, Ablation, Antarctica—Hoare, Lake

53-1793

**McMurdo Dry Valleys LTER: phosphorus deficiency and alkaline phosphatase activity in lakes of Taylor Valley, Antarctica.**

Dore, J.E., Priscu, J.C., *Antarctic journal of the United States*, 1996, 31(2), p.206-208, 7 refs.

Limnology, Ice cover effect, Plant physiology, Photosynthesis, Nutrient cycle, Water chemistry, Antarctica—Bonney, Lake, Antarctica—Hoare, Lake

53-1794

**Growth dynamics of *Phaeocystis antarctica*-dominated plankton assemblages from the Ross Sea.**

Smith, W.O., Jr., Carlson, C.A., Ducklow, H.W., Hansell, D.A., *Marine ecology progress series*, July 9, 1998, Vol.168, p.229-244, 52 refs.

Marine biology, Microbiology, Biomass, Plankton, Sea water, Water chemistry, Nutrient cycle, Organic nuclei, Solubility, Ecology, Growth, Sampling, Simulation, Antarctica—Ross Sea

53-1795

**Clustering and aggregations of minke whales in the antarctic feeding grounds.**

Kasamatsu, F., Ensor, P., Joyce, G.G., *Marine ecology progress series*, July 9, 1998, Vol.168, p.1-11, 28 refs.

Marine biology, Biomass, Ecology, Distribution, Oceanographic surveys, Aggregates, Statistical analysis, Antarctica—Weddell Sea

53-1796

**Erodibility and critical shear of a previously frozen soil.**

Van Klaveren, R.W., McCool, D.K., *American Society of Agricultural Engineers. Transactions*, 1998, 41(5), p.1315-1321, 18 refs.

Agriculture, Soil erosion, Water erosion, Soil conservation, Ground thawing, Frozen ground mechanics, Freeze thaw cycles, Interfacial tension, Shear stress, Shear properties, Mechanical tests

53-1797

**Vast training space lures diverse forces to Alaska.**  
Fulghum, D.A., *Aviation week & space technology*, Sep. 21, 1998, p.54-55, 57.

Military facilities, Aircraft, Airports, Warning systems, Military research, Subpolar regions, Education, Military operation, International cooperation, United States—Alaska

53-1798

**International Pavement Subgrade Performance Study.**

Macdonald, R., *Nordic road and transport research*, 1998, No.2, p.9-10, 3 refs.

Research projects, Road maintenance, Pavement bases, Subgrade soils, Deformation, Dynamic loads, Mechanical tests, Strain measuring instruments

53-1799

**Experimental test of limits to tree establishment in arctic tundra.**

Hobbie, S.E., Chapin, F.S., III, *Journal of ecology*, 1998, Vol.86, p.449-461, 48 refs.

Forest ecosystems, Forest tundra, Tundra climate, Greenhouse effect, Global warming, Forest lines, Tundra vegetation, Growth, Nutrient cycle, Ion exchange, Revegetation, Simulation, United States—Alaska—Toolik, Lake

53-1800

**Electrical charge may prevent ice build up.** *Chemical engineering progress*, May 1998, 94(5), p.12.

Aircraft icing, Ice prevention, Ice solid interface, Ice adhesion, Electric charge, Polarization (charge separation), Electrical resistivity, Ice electrical properties, Theories

53-1801

**Ground-penetrating radar reflection profiling of groundwater and bedrock in an area of discontinuous permafrost.**

Arcone, S.A., Lawson, D.E., Delaney, A.J., Strasser, J.C., Strasser, J.D., *MP 5257, Geophysics*, Sep.-Oct. 1998, 63(5), p.1573-1584, 37 refs.

Geophysical surveys, Discontinuous permafrost, Subpermafrost ground water, Radar echoes, Attenuation, Sediments, Alluvium, Bedrock, Unfrozen water content, Profiles, Interfaces, Dielectric properties, Well logging, Snow cover effect, United States—Alaska—Fort Wainwright

Ground-penetrating radar was used to profile the depth to permafrost, to groundwater beneath permafrost, and to bedrock within permafrost in alluvial sediments of interior Alaska. Well log data were used to aid the interpretations and to calculate dielectric permittivities for frozen and unfrozen materials. Interfaces between unfrozen and frozen sediments above permafrost were best resolved with wavelet bandwidths centered at and above 100 MHz. The resolution also required consideration of antenna configuration, season, and surface conditions. Depths to subpermafrost groundwater were profiled where it was in continuous contact with the bottom of the permafrost, except near transitions to unfrozen zones, where the contact appeared to dip steeply. The complexity of the responses to intrapermafrost bedrock, detected at a maximum depth of 47 m, appears to distinguish these events from those of subpermafrost saturated sediments. The relative dielectric permittivity ranged between 4.4 and 8.3 for the permafrost, and between 12 and 45 for partially to fully saturated, unfrozen silts and sands. Scattering losses are evident from intrapermafrost diffractions and from the improved penetration achieved by lowering the midband radar frequency from 100 to 50 MHz.

53-1802

**Sampling trace-level organic solutes with polymeric tubing: Part I. static studies.**

Parker, L.V., Ranney, T.A., *MP 5258, Ground water monitoring review*, 1997, Fall, p.115-124, 23 refs.

Ground water, Water pollution, Hydrocarbons, Solutions, Pipes (tubes), Polymers, Sampling, Accuracy, Tensile properties, Absorption, Leaching, Correlation  
Twenty polymeric tubings were filled with a test solution containing eight organic solutes. The test solutions were monitored for losses, indicating that sorption had occurred, and for signs that leaching of organic constituents had occurred. The tubings tested included seven flexible products and eight fluoropolymers. Among the rigid tubings tested, three fluoropolymers (fluorinated ethylene propylene [FEP], FEP-lined polyethylene, polyvinylidene fluoride) were the least sorptive tubings. However, even these tubings readily sorbed some of the analytes. Among the flexible tubings tested, a fluorocopolymer tubing and a tubing made of a copolymer of vinylidene fluoride and hexafluoropropylene were the least sorptive. Several of the tubings tested leached constituents into the test solution. The polyurethane, polyamide, flexible polyvinyl chloride (PVC), polyester-lined PVC, and silicone-modified thermoplastic elastomer tub-

ings were found to leach the most constituents. The authors were unable to detect any constituents leaching from the polyethylene tubings, the rigid fluoropolymer tubings, and one of the plasticized polypropylene tubings.

### 53-1803

#### Sampling trace-level organic solutes with polymeric tubing: Part 2. dynamic studies.

Parker, L.V., Ranney, T.A., MP 5259, *Ground water monitoring review*, 1998, Winter, p.148-155, 12 refs.

Ground water, Water pollution, Hydrocarbons, Polymers, Pumps, Pipes (tubes), Solutions, Flow rate, Liquid solid interfaces, Absorption, Leaching, Tensile properties, Sampling, Classifications

This is the second part of a study conducted to determine whether polymeric sampling tubing can affect organic analyte concentrations during a sampling event. The authors looked for sorption and desorption of trichloroethylene (TCE) and leaching of organic constituents in water pumped through five types of polymeric tubing. The materials tested were a rigid fluoropolymer, a flexible fluoropolymer, low-density polyethylene (LDPE), and two plasticized polypropylene tubings. The effects of tubing length and flow rate were examined. The least sorptive tubings, both initially and at equilibrium, were the fluoropolymers. In some instances the LDPE tubing had little effect on TCE concentrations. This was when a slow flow rate was used to sample relatively shallow wells (50 feet or less) or when a faster flow rate (1 L/min) was used to sample wells that are less than 500 feet. Further testing is recommended using more sorptive analytes. High performance liquid chromatography did not detect any constituents leaching from any of the tubings used in these studies, even when a slow flow rate was used. However, desorption of sorbed analytes is a concern for all the tubings tested, including the rigid fluoropolymer.

### 53-1804

#### Comparison of fiberglass and other polymeric well casings: Part II. sorption and leaching of trace-level organics.

Ranney, T.A., Parker, L.V., MP 5260, *Ground water monitoring review*, 1998, Spring, p.107-112, 16 refs.

Ground water, Sampling, Water pollution, Hydrocarbons, Well casings, Polymers, Hydrocarbons, Leaching, Absorption, Degradation, Chemical composition, Classifications

This paper contains the results of a laboratory study that was designed to compare sorption of low concentrations of 11 organic solutes by six polymeric materials (acrylonitrile butadiene styrene [ABS], fluorinated ethylene propylene [FEP], fiberglass-reinforced epoxy [FRE], and fiberglass-reinforced plastic [FRP], polyvinyl chloride [PVC], and polytetrafluoroethylene [PTFE]). During this six-week study, ABS sorbed analytes much more rapidly and to a greater extent than did the other materials, and PVC and FRE sorbed analytes more slowly and to a lesser extent than the other materials tested. As the study progressed, an increasing number of spurious peaks were found in the high performance liquid chromatography chromatograms of some samples, indicating that leaching of some constituents had occurred. By the end of the study, there were 11 additional peaks in the ABS samples, five in the FRP samples, and one in the FRE samples. Analysis by purge and trap gas chromatography/mass spectrometry of those samples and of well water samples that were exposed to the casings for 500 hours revealed the identity of some of the leached constituents: acrylonitrile and styrene (components of ABS), chloroform and ethylbenzene (an intermediate in the production of styrene) from the ABS pipe, and toluene, 1,1,1-trichloroethane, and ethylbenzene from the FRP casing.

### 53-1805

#### Comparison of fiberglass and other polymeric well casings: Part III. sorption and leaching of trace-level metals.

Ranney, T.A., Parker, L.V., MP 5261, *Ground water monitoring review*, 1998, Summer, p.127-133, 21 refs.

Ground water, Water pollution, Well casings, Polymers, Cellular plastics, Chemical composition, Leaching, Absorption, Metals, Classifications, Performance

This series of experiments was initiated to determine the overall suitability of three alternative polymeric well casing materials (fluorinated ethylene propylene [FEP], fiberglass-reinforced epoxy [FRE], and fiberglass-reinforced plastic [FRP] for use in ground water monitoring wells and to compare these materials with polyvinyl chloride (PVC) and polytetrafluoroethylene (PTFE) well casings. This paper focuses on sorption and leaching of metals. Generally, the fiberglass materials leached more metal contaminants than PVC, FEP, and PTFE. However, with one exception (Pb leaching from FRP), leached concentrations were below maximum allowable limits set by the U.S. Environmental Protection Agency for drinking water. With respect to sorption, none of the polymers sorbed the anions tested, but all of them sorbed one or more of the cations tested. FEP and PTFE were much less sorptive than the other materials.

### 53-1806

#### Electric vehicle traction and rolling resistance in winter.

Shoop, S.A., MP 5262, *Tire science and technology*, Apr.-June 1998, 26(2), p.64-83, 17 refs.

Vehicles, Tires, Traction, Sliding, Ice solid interface, Snow surface temperature, Cold weather performance, Cold weather tests, Dynamometers, Classifications

Low rolling resistance tires help optimize the economy of electric vehicle (EV) operation. Five types of EV tires were evaluated under cold weather conditions and compared with traditional winter tires in terms of traction and rolling resistance. Other contributions to vehicle resistance (brake drag, wheel bearing resistance, driveline resistance, and air drag) were also measured and used to estimate changes in total vehicle resistance and associated changes in range with temperature. At low speeds, tire rolling resistance is the primary contribution to increased vehicle resistance at cold temperatures, with snow tires having both higher resistance and a stronger dependence on temperature than low rolling resistance tires. Lowering tire pressure increases both resistance and temperature dependence for most tires but also improves traction and therefore may serve as a temporary safety measure in winter conditions.

### 53-1807

#### Fast, physically based point snowmelt model for use in distributed applications.

Albert, M., Krajewski, G., MP 5263, *Hydrological processes*, 1998, Vol. 12, p.1809-1824, 20 refs.

Snow hydrology, Snow physics, Snowmelt, Rain, Ice water interface, Surface energy, Water flow, Mathematical models, Computerized simulation, Theories, Runoff forecasting

A new mathematical solution to the problem of water flow through snow is presented and its implementation in a snowmelt model, SNAP, is discussed. An analytical solution for vertical water flow through homogeneous snow is developed and formulae that allow the solution to accommodate time-varying surface input from rain or snowmelt are derived. This facilitates use of the technique in a computer snowmelt model. Because the new technique requires no matrix computation, it is sufficiently computationally efficient to be a candidate for use in watershed-scale, distributed forecasting systems. Because it is a physically-based model that takes into account the effect of the snow itself on the timing and magnitude of outflow, the model allows more accurate prediction of the magnitude and timing of snowmelt than in currently employed operational models. Results of the new model agree well with previous theoretical solutions and with field measurements of melt and rain-on-snow events in a seasonal snow pack.

### 53-1808

#### Condensation and frosting in energy wheels.

Simonson, C.J., Besant, R.W., Wilson, G.W., National Heat Transfer Conference, 32nd, Baltimore, MD, Aug. 8-12, 1997. Proceedings, Vol. 1: Current developments in numerical simulation of heat and mass transfer, New York, American Society of Mechanical Engineers, 1997, p.161-169, HTD-Vol.339, 17 refs.

DLC TJ260.N36 1997 vol.1

Heat transfer, Moisture transfer, Thermodynamics, Mathematical models, Condensation, Icing, Ventilation, Air conditioning, Dehumidification, Defrosting, Ice prevention

### 53-1809

#### Dredging as remediation for white phosphorus contamination at Eagle River Flats, Alaska.

Walsh, M.R., Collins, C.M., CR 98-05, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Aug. 1998, 32p., ADA-354 017, 20 refs.

Dredging, Sediments, Attenuation, Land reclamation, Military operation, Military facilities, Swamps, Explosives, Estuaries, Grain size, Water pollution, Soil pollution, United States—Alaska—Fort Richardson, United States—Alaska—Eagle River Flats

The Eagle River Flats impact area is a Ft. Richardson Superfund site. It is a salt marsh that is contaminated with white phosphorus, and remediation of sediments in permanently ponded areas may require dredging. A remotely piloted dredging system was designed, constructed, and deployed at the Flats as part of the overall site remediation feasibility study. Experience gained over two years of engineering study and contract operation indicates that, although feasible and effective, this alternative is slow, difficult and very expensive.

### 53-1810

#### Determination of nitroaromatic, nitramine, and nitrate ester explosives in water using SPE and GC-ECD: comparison with HPLC.

Walsh, M.E., Ranney, T.A., CR 98-02, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, June 1998, 28p., ADA-353 441, 32 refs.

Explosives, Water pollution, Water chemistry, Chemical analysis

An analytical method for the determination of nitroaromatic, nitramine, and nitrate ester explosives and co-contaminants in water was developed based on SPE (solid-phase extraction) and GC-ECD (gas chromatograph-electron capture detector). Water samples are pre-concentrated using either cartridge or membrane SPE followed by elution with acetonitrile. The acetonitrile extract is compatible with both liquid and gas chromatography, allowing direct comparison of concentration estimates obtained by different methods of determination. Quantitative GC analyses were obtained by using deactivated direct-injection-port liners, short wide-bore capillary columns, and high linear carrier gas velocities. Recoveries from spiked samples were 90% or greater for each of the nitroaromatics and nitrate esters, and greater than 70% for nitramines and amino-nitrotoluenes. Estimates of analyte concentrations in well-water extracts from military sites in the United States and Canada analyzed by GC-ECD and the standard HPLC (high performance liquid chromatography) method showed good agreement for the analytes most frequently detected (HMX [octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine], RDX [hexahydro-1,3,5-trinitro-1,3,5-triazine], TNT [2,4,6-trinitrotoluene], and TNB [1,3,5-trinitrobenzene]). The GC method provides lower method detection limits for most analytes than HPLC, but accurate calibration is more difficult. The ultraviolet detector used for the HPLC analysis has much greater linear range than the ECD used for GC analysis. The GC instrumentation requires more care than the LC: the injection port liner must be changed frequently to maintain accurate determination of the nitramines. Because the sample preparation technique yields extracts that are compatible with both GC and HPLC analysis, confirmation of analyte presence can be obtained based on different physical properties.

### 53-1811

#### Structural analysis of DEW line station DYE-2, Greenland: 1983-1988.

Walsh, M.R., Ueda, H.T., CR 98-03, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, June 1998, 23p., ADA-353 518, 17 refs.

Structural analysis, Footings, Stresses, Settlement (structural), Structural changes, Loads (forces), Snow cover stability, Stations, Site surveys, Greenland—Dye 2

DYE-2, a Distant Early Warning station, is located on the Greenland ice cap approximately along the Arctic Circle, 470 km from the west coast. The viscous nature of the material on which the structure is grounded made periodic monitoring and maintenance of the supporting structure necessary. This report analyzes the stresses developed within the structure from the last major maintenance operation, a 64 m sideways move in 1982 to a new foundation, to the final set of stress measurements taken at the abandoned site in 1988. Conclusions drawn from these measurements and the subsequent analysis were that the building system was continuing to tilt in one direction because of differential footing settlement caused by changing footing conditions, and high structural stresses would make it unsafe for reoccupation after Dec. 1988 unless emergency maintenance was performed. The U.S. Air Force officially abandoned the site in Aug. 1988 as a result of this analysis.

### 53-1812

#### Geological and geophysical investigations of the hydrogeology of Fort Wainwright, Alaska. Part II: North-central cantonment area.

Lawson, D.E., et al, CR 98-06, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Aug. 1998, 66p., ADA-355 283, 23 refs. For part 1 see 51-512.

Hydrogeology, Ground water, Discontinuous permafrost, Seepage, Radio echo soundings, Permafrost distribution, United States—Alaska—Fort Wainwright, United States—Alaska—Chena River

Ongoing investigations of the permafrost and ground water conditions in the north-central area of the Fort Wainwright, AK, cantonment, north of the Chena River, show the hydrogeology of the site to be extremely complex. Permafrost, being impermeable and discontinuous, controls the distribution and dimensions of ground water aquifers to a great degree. Aquifers are above, below, and adjacent to permafrost, and in some locations are within unfrozen zones surrounded by it. This complexity makes it difficult to predict the direction and velocity of ground water flow, as well as its seasonal and annual variability. Data have been obtained from ground-penetrating radar surveys, borehole logs, and ground water instruments. They have then been combined with interpretations of aerial photographs and ground observations to delineate the permafrost and aquifer distribution. They have also been used to develop conceptual hydrogeological models of the area. This information is necessary to remediate ground water contamination, while furthering the basic understanding of aquifer distribution and ground water flow in discontinuous permafrost terrain.

53-1813

**Investigations of plastic composite materials for highway safety structures.**

Dutta, P.K., CR 98-07, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Aug. 1998, 73p., ADA-353 418, Refs. p.58-61.

Composite materials, Polymers, Safety, Cold weather performance, Structures, Construction materials, Compressive properties, Stress strain diagrams, Tensile properties, Creep, Highway planning, Road maintenance

This report presents a basic overview and assessment of different concepts and technologies of using polymer composites in structures generally used for highway safety. The structural systems included a highway barrier guardrail with its posts and blockouts, sign posts, concrete reinforcing rebars, breakaway couplers, and crushable plastic cushions to protect errant drivers from roadside sign and utility posts, and small trees. The composites included fiber reinforced plastics (FRP) in laminated and bar forms, and commercially available recycled and reconstituted structural plastic composites. Commercially available FRP composites, recycled plastic composites, and several conceptual designs and prototype components were assessed and tested. The results showed many potential advantages of using composites in almost all the structures considered, but one-to-one replacement of conventional materials was not always found attractive. For deriving maximum benefits from fiber composites, the basic performance of the given structures should be reassessed and then composites should be designed at the materials level using innovative fiber architecture and appropriate manufacturing technologies that can meet those performance requirements.

53-1814

**Remediation of wastewater by land treatment: consideration of soil temperatures in winter.**

Peck, L., CR 98-08, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Aug. 1998, 18p., ADA-353 412, 23 refs.

Soil microbiology, Cryobiology, Frozen ground chemistry, Soil chemistry, Frozen ground temperature, Temperature measurement, Porosity, Soil water, Frost penetration, Heat transfer, Waste treatment, Water treatment, Cold weather operation, Land reclamation

The impact of the winter environment on land treatment of wastewater has been investigated in terms of predicted winter-long soil temperature histories and depths of frost penetration that were obtained from numerical modeling of heat transfer and phase change in sandy soil. Severity of the winter, soil porosity, and soil moisture content are varied to determine the depth-dependent changes in soil temperature that result. The impact of wintertime soil temperatures on nitrification and denitrification is presented in terms of thickness and persistence of a soil layer cold enough to severely inhibit microbial activity. The model WASTEN is used to predict concentrations of ammonium and nitrate in soil at the end of a remediation cycle. Rates of nitrification and denitrification are varied to be consistent with decreasing microbial activity as soil cools. Depending on soil temperature and thickness of the cold soil layer, peak concentrations of ammonium and nitrate remaining in the soil can be as much as 40-100% greater than under warm soil conditions.

53-1815

**Soil-vapor versus discrete soil sample measurements for VOCs in the near-surface vadose zone: feasibility study.**

Hewitt, A.D., SR 98-07, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, June 1998, 9p., ADA-351 051, 24 refs.

Soil pollution, Soil analysis, Soil tests, Soil chemistry, Measuring instruments, Design

Soil vapor samples were taken from 1 m beneath the ground surface at 16 different locations. Measured trichloroethene (TCE) in these samples was compared to that obtained for a collocated sample of the soil matrix. The linear slope (0.806) and strong correlation ( $r^2=0.950$ ) obtained for this comparison of soil vapor (mg TCE/L) to soil mass (mg TCE/kg) concentrations are in good agreement with recent theoretical and empirical models for this volatile organic compound (VOC) in a low organic carbon soil matrix. This strong relationship suggests that active soil-vapor measurements could be used as an alternative to collecting and analyzing discrete soil samples for establishing both the presence and concentration of VOCs during site characterization and monitoring. The techniques and instruments described here are robust, simple to use, and designed to enhance the reliability of soil-gas surveys to characterize vadose zone VOC contamination.

53-1816

**Site characterization for explosives contamination at a military firing range impact area.**

Jenkins, T.F., et al, SR 98-09, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Aug. 1998, 40p., ADA-353 433, 19 refs.

Explosives, Environmental impact, Soil pollution, Soil analysis, Site surveys, Military operation

A study was conducted at the inland firing ranges at Fort Ord to determine the current levels of explosives residues and to recommend appropriate future site characterization techniques. A set of 280 soil samples was collected on the basis of the locations of current and former targets, and included an area away from specific targets and a background area, not affected by local detonations. HMX was the explosives residue present at the highest concentration. Much lower concentrations of RDX, TNT, and two isomers of aminodinitrotoluene were also detected. Explosives residues were largely confined to surface soils near tank targets. A major problem for site characterization was found to be the large spatial heterogeneity present. Composite samples very effectively provided representative samples for 5x5 m size grids. A colorimetric on-site method gave reliable results for HMX, relative to SW846 Method 8330. No currently available on-site method for RDX was found to be adequate in the presence of much higher concentrations of HMX.

53-1817

**ICETHK user's manual: version 1.**

Tuthill, A.M., Wuebben, J.L., Gagnon, J.J., SR 98-11, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Sep. 1998, 26p., ADA-355 159, 11 refs.

Ice models, Computer programs, Computerized simulation, Ice jams, Ice cover thickness, River ice, United States—Vermont—Winooski River

This report describes the ICETHK computer model that is used in conjunction with the HEC-2 backwater model to simulate equilibrium ice jam profiles. The ICETHK model fulfills an important need in studies that require the calculation of ice-jam-affected stage. This report presents the theory and limitations of ICETHK and serves as a user's manual, and concludes with a discussion of river ice modeling using ICETHK.

53-1818

**Ground freezing effects on soil erosion of Army training lands. Part 2: overwinter changes to tracked-vehicle ruts, Yakima Training Center, Washington.**

Halvorson, J.J., McCool, D.K., King, L.G., Gatto, L.W., SR 98-08, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, July 1998, 46p., ADA-354 121, 30 refs. For pt.1 see 52-2227.

Soil erosion, Soil freezing, Military operation, Tracked vehicles, Environmental impact, Freeze thaw cycles, Soil compaction

Two areas were monitored at the Yakima Training Center in central Washington to measure changes in M1A2 Abrams tank-rut surface geometry, and in- and out-of-rut saturated hydraulic conductivity ( $K_{fs}$ ), soil penetration resistance (SPR), and bulk density over the 1995-96 winter. Profile meter data show that rut cross-sectional profiles smoothed significantly and that turning ruts did so more than straight ruts. Rut edges were zones of erosion and sidewall bases were zones of deposition.  $K_{fs}$  values were similar in and out of ruts formed on soil with 0-5% water by volume, but were lower in ruts formed on soil with about 15% water. Mean SPR was similar in and out of ruts from 0- to 5-cm depth, increased to 2 MPa outside ruts and 4 MPa inside ruts at 10- to 15-cm depth, and decreased by 10-38% outside ruts and by 39-48% inside ruts at the 30-cm depth. Soil bulk density was similar in and out of ruts from 0- to 2.5-cm depth, and below 2.5 cm it was generally higher in ruts formed on moist soil, with highest values between 10- and 20-cm depth. Conversely, density in ruts formed on dry soil was similar to out-of-rut density at all depths. This information is important for determining impacts of tank ruts on water infiltration and soil erosion, and for modifying the Revised Universal Soil Loss Equation and the Water Erosion Prediction Project models to more accurately predict soil losses on Army training lands.

53-1819

**Design of the crest of earth-and-rock dams in the northern construction-climatic zone.**

Pekhtin, V.A., Serov, A.A., Susloparov, V.A., *Hydrotechnical construction*, Sep. 1998(Pub. Mar.98), 32(3), p.151-156, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 2 refs.

Earth dams, Permafrost beneath structures, Frost heave, Settlement (structural), Construction, Frost protection, Soil temperature, Thermal regime, Design criteria, Building codes

53-1820

**Contribution to the problem of so-called anti-heave heads of crests of dams being constructed in the far north.**

Myznikov, I.U.N., *Hydrotechnical construction*, Sep. 1998(Pub. Mar.98), 32(3), p.157-162, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 2 refs.

Earth dams, Embankments, Cryogenic soils, Construction, Seasonal freeze thaw, Frost heave, Frost protection, Design criteria, Building codes, Russia—Far North

53-1821

**Orbital forcing and Eocene continental temperatures.**

Sloan, L.C., Morrill, C., *Palaeogeography, palaeoclimatology, palaeoecology*, Nov. 15, 1998, 144(1-2), p.21-35, 37 refs.

Pleistocene, Paleoclimatology, Climatic changes, Air temperature, Temperature variations, Solar radiation, Insolation, Seasonal variations, Models

53-1822

**Solar cycles recorded in carboniferous glaci-marine rhythmites (western Argentina): relationships between climate and sedimentary environment.**

Milana, J.P., Lopez, S., *Palaeogeography, palaeoclimatology, palaeoecology*, Nov. 15, 1998, 144(1-2), p.37-63, Refs. p.60-63.

Pleistocene, Paleoclimatology, Climatic changes, Glacial geology, Sedimentation, Glacial deposits, Marine deposits, Ice rafting, Solar radiation, Periodic variations, Stratigraphy, Geochronology, Argentina

53-1823

**Thermoluminescence chronology of sand profiles in the Mu Us Desert, China.**

Sun, J.M., Yin, G.M., Ding, Z.L., Liu, T.S., Chen, J., *Palaeogeography, palaeoclimatology, palaeoecology*, Nov. 15, 1998, 144(1-2), p.225-233, 43 refs.

Pleistocene, Paleoclimatology, Climatic changes, Sands, Loess, Eolian soils, Luminescence, Soil dating, Geochronology, Stratigraphy, Profiles, China—Mu Us Desert

53-1824

**Radiocarbon age constraints on rates of advance and retreat of the Puget Lobe of the Cordilleran ice sheet during the last glaciation.**

Porter, S.C., Swanson, T.W., *Quaternary research*, Nov. 1998, 50(3), p.205-213, 31 refs.

Pleistocene, Quaternary deposits, Lacustrine deposits, Paleoclimatology, Ice sheets, Glacier oscillation, Ice edge, Calving, Glacial deposits, Radioactive age determination, Geochronology, United States—Washington—Puget Lowland

53-1825

**Clay minerals in soils as evidence of Holocene climatic change, central Indo-Gangetic plains, north-central India.**

Srivastava, P., Parkash, B., Pal, D.K., *Quaternary research*, Nov. 1998, 50(3), p.230-239, 46 refs.

Paleoclimatology, Climatic changes, Quaternary deposits, Soil formation, Plains, Clay minerals, Soil tests, Luminescence, Scanning electron microscopy, Radioactive age determination, Geochronology, India

53-1826

**Do stable isotope data from calcrete record Late Pleistocene monsoonal climate variation in the Thar Desert of India.**

Andrews, J.E., et al, *Quaternary research*, Nov. 1998, 50(3), p.240-251, 56 refs.

Pleistocene, Paleoclimatology, Climatic changes, Precipitation (meteorology), Desert soils, Soil analysis, Luminescence, Isotope analysis, Geochronology, India

53-1827

**Isotopic fingerprints of paleoclimates during the last 30,000 years in deep confined groundwaters of southern India.**

Sukhija, B.S., Reddy, D.V., Nagabhushanam, P., *Quaternary research*, Nov. 1998, 50(3), p.252-260, 41 refs.

Pleistocene, Paleoclimatology, Climatic changes, Ground water, Radioactive isotopes, Isotope analysis, Geochemistry, Statistical analysis, Geochronology, India



## 53-1828

**SAR interferometry over Baltic Sea ice.**

Dammert, P.B.G., Leppäranta, M., Askne, J., *International journal of remote sensing*, Nov. 10, 1998, 19(16), p.3019-3037, 27 refs.

Sea ice distribution, Ice mechanics, Spaceborne photography, Synthetic aperture radar, Backscattering, Fast ice, Ice deformation, Surface roughness, Rheology, Image processing, Baltic Sea, Bothnia, Bay

## 53-1829

**Photoinduced crystallization of amorphous ice films on graphite.**

Chakarov, D., Kasemo, B., *Physical review letters*, Dec. 7, 1998, 81(23), p.5181-5184, 29 refs.

Ice physics, Amorphous ice, Ice electrical properties, Defects, Molecular structure, Water films, Ice formation, Ice vapor interface, Ultraviolet radiation, Ice spectroscopy, Phase transformations, Light effects

## 53-1830

**Comparison of results of impact tests on laboratory and natural freshwater ice with hydrodynamic model predictions.**

Likhomanov, V.A., Stepanov, I.V., Frederking, R.M.W., Timco, G.W., *International Offshore and Polar Engineering Conference*, 8th, Montreal, Canada, May 24-29, 1998. Proceedings. Vol.2, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1998, p.452-459, 5 refs.

Ice navigation, Metal ice friction, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice deformation, Ice breaking, Impact tests, Environmental tests, Mathematical models

## 53-1831

**Canadian Ice Regime System database.**

Timco, G.W., Morin, I., *International Offshore and Polar Engineering Conference*, 8th, Montreal, Canada, May 24-29, 1998. Proceedings. Vol.2, Golden, CO, International Society of Offshore and Polar Engineers (ISOPE), 1998, p.586-591, 8 refs. For another version see 51-4969.

Sea ice distribution, Ice conditions, Ice navigation, Ice forecasting, Ice reporting, Safety, Data processing, Data transmission, Canada

## 53-1832

**System and method for detecting accretion of frazil ice on underwater gratings.**

Yankielun, N.E., Gagnon, J.J., MP 5264, *U.S. Patent Office. Patent*, Nov. 24, 1998, 6 col., USP-5,841,289, 12 refs.

Water intakes, Frazil ice, Ice accretion, Ice detection, Monitors, Telemetering equipment

A system for detecting accretion of frazil ice on underwater gratings comprises a pair of parallel electrically conductive bars mounted side-by-side, for disposition beneath a water surface and spaced from but proximate an underwater intake grating. The system further includes a coaxial transmission line connected at a first end to the pair of bars for extension from the bars upwardly above the water surface, and a time domain reflectometer disposed above the water surface for generating electromagnetic pulses and having a second end of the transmission line fixed thereto. The transmission line facilitates propagation of the pulses to the bars for further travel to distal ends of the bars, and back to the reflectometer. The reflectometer is adapted to compute pulse round trip travel time in the bars and to compute changes in the round trip travel time, from which can be determined absence, presence, and build-up of frazil ice on the bars, providing an indication of same on the grating. The invention further contemplates a method for detecting accretion of frazil ice on underwater gratings, utilizing the above-described system.

## 53-1833

**Capacitor for water leak detection in roofing structures.**

Yankielun, N.E., Flanders, S.N., MP 5265, *U.S. Patent Office. Patent*, Sep. 8, 1998, 4 col., USP-5,804,721, 12 refs.

Roofs, Leakage, Moisture detection, Moisture meters, Electrical measurement

A pair of metal plates having a space therebetween are surrounded by a flexible enclosure which is waterproof and which is filled with a dry gas. A pair of electrical conductors connected to the plates extend through and are water-tight sealed to the enclosure. A water-deformable element which expands in the presence of moisture is disposed around the enclosure, and a rigid housing having holes therethrough is disposed around the water-deformable element so that moisture passing through the holes into the water-deformable

element causes it to expand to move the enclosure and at least one plate so as to reduce the space between the plates to change the capacitance of the capacitor.

## 53-1834

**Doppler velocimeter for monitoring groundwater flow.**

Yankielun, N.E., MP 5266, *U.S. Patent Office. Patent*, Aug. 18, 1998, 6 col., USP-5,796,679, 4 refs. Ground water, Water flow, Flow measurement, Acoustic measurement, Borehole instruments, Sub-surface investigations

Groundwater velocity and direction of flow are determined by insertion into a borehole below the water table of a sound source and a plurality of sound sensors. A periodic sound signal is emitted by the sound source, which is submerged in ground water at the bottom of the borehole. The sound signals are sensed by the sound sensors, which are also submerged in the water in the vicinity of the sound source. Owing to the Doppler effect, there is a shift in the frequency of the sound signals observed by the different sound sensors. The differences in frequency are determined by pulse counters and used to compute the components of groundwater velocity along north-south and east-west axes. The velocity of groundwater flow and its direction are determined by vector addition of the groundwater velocity components. These computational processes are carried out by an appropriately programmed microprocessor.

## 53-1835

**Water/sediment interface monitoring system using frequency-modulated continuous wave.**

Yankielun, N.E., Zabilansky, L.J., MP 5267, *U.S. Patent Office. Patent*, Aug. 4, 1998, 6 col., USP-5,790,471, 12 refs.

Bridges, Piers, River flow, Suspended sediments, Alluvium, Water erosion, Monitors, Telemetering equipment

The water/sediment interface in a body of water near bridge piers and similar structures exposed to scour, is sensed and transformed by a frequency-modulated continuous wave method into an audio frequency signal that is related to the water/sediment interface elevation, which is transmitted by radio signal to a remote monitoring station. Radio signals received at the monitoring station are transmitted to a computer, which is programmed to compute the water/sediment interface elevation and to store such computed results for later use. A remote monitoring station may be equipped to monitor several water/sediment interface sensors.

## 53-1836

**Time domain reflectometry system for real-time bridge scour detection and monitoring.**

Yankielun, N.E., Zabilansky, L.J., MP 5268, *U.S. Patent Office. Patent*, July 21, 1998, 6 col., USP-5,784,338, 12 refs.

Bridges, Piers, River flow, Water erosion, Ice scouring, Ice erosion, Monitors, Telemetering equipment, Warning systems

An apparatus for detecting and monitoring scouring around a structural member uses time-domain reflectometry to measure the level of sediment around the submerged portion of a structural member such as a bridge pier, dock, utility crossing, or similar structure. The apparatus includes an electrical pulse generator which transmits a series of electrical pulses, a sensor which is connected with the pulse generator, and a signal analyzer which receives and interprets the portion of the electrical pulses reflected back to the source from an interface, such as water/air or water/gravel, to calculate the position of the interface along the sensor. Knowledge of the position of the interfaces before and after a scouring event and of the dielectric constants of the surrounding media allows the user to detect and monitor the level of erosion caused by scouring.

## 53-1837

**Validation of liquid-cloud water forecasts from the Smith-Feddes method derived from soundings and LAPS analyses.**

McGinley, J.A., Albers, S.C., *International Conference on Aviation Weather Systems*, 4th, Paris, France, June 24-28, 1991, Boston, American Meteorological Society, 1991, p.228-233, 7 refs. Aircraft icing, Ice forecasting, Cloud physics, Clouds (meteorology), Water content, Weather forecasting

## 53-1838

**Liquid water profiling using remote sensor observations.**

Stankov, B.B., Schroeder, J.A., Westwater, E.R., Rasmussen, R.M., *International Conference on Aviation Weather Systems*, 4th, Paris, France, June 24-28, 1991, Boston, American Meteorological Society, 1991, p.239-246, 21 refs.

Aircraft icing, Ice forecasting, Cloud physics, Clouds (meteorology), Water content, Moisture detection, Air temperature, Cloud height indicators, Radio echo soundings, Radiometry, Weather forecasting

## 53-1839

**Maximum hail concentration that can be met by an aircraft in stormy precipitations.**

Husson, D., Mezeix, J.F., *International Conference on Aviation Weather Systems*, 4th, Paris, France, June 24-28, 1991, Boston, American Meteorological Society, 1991, p.253-256, 9 refs.

Aircraft icing, Thunderstorms, Hail, Hailstones, Weather forecasting, Safety

## 53-1840

**Experiments forecasting maximum hailstone size from forecast soundings using an interactive program.**

Moore, J.T., Pino, J.P., Rinderknecht, D.M., *International Conference on Aviation Weather Systems*, 4th, Paris, France, June 24-28, 1991, Boston, American Meteorological Society, 1991, p.268-269, 5 refs.

Hailstones, Particle size distribution, Sounding, Weather forecasting, Computerized simulation

## 53-1841

**Waterfowl mortality in Eagle River Flats, Alaska: the role of munitions compounds and human health risk assessment.**

Bird, S.T., et al, MP 5269, *Caribbean HAZTECH International Conference and Exhibition*, San Juan, Puerto Rico, Nov. 13-15, 1991, [1991], p.1A/1-1A/15, 15 refs.

Military facilities, Explosives, Water pollution, Soil pollution, Physiological effects, Health, Estuaries, Wetlands, Bottom sediment, United States—Alaska—Fort Richardson, United States—Alaska—Eagle River Flats

## 53-1842

**Report: Arctic Bathymetry Workshop, St. Petersburg, Russia, September 18-19, 1997.**

Macnab, R., Grikurov, G.E., *Canada. Geological Survey. Open file*, Sep. 1997, No.3569, 3p. + appends., 3 refs.

Research projects, Meetings, Oceanographic surveys, Ocean bottom, Bottom topography, Sounding, Data processing, Mapping

## 53-1843

**Electrical conductivity, freezing temperature, and salinity relationships for seawater and sodium chloride solutions for the salinity range from 0 to over 200 ppt.**

Baker, G.C., *Alaska. University. Geophysical Institute. Report*, Sep. 1987, UAG R-310, 87p., 17 refs.

Sea water, Salt water, Water temperature, Salinity, Electrical resistivity, Sea water freezing, Freezing points, Mathematical models

## 53-1844

**Effects of increased salt usage on the chloride concentration in South Dakota Department of Transportation bridges and roads.**

Marks, K.E., Pierre, *South Dakota Department of Transportation*, May 1990, 9p.

Salting, Bridges, Corrosion, Road maintenance, Highway planning, United States—South Dakota

## 53-1845

**Chip seal winter maintenance costs. Alberta Transportation and Utilities. Research and Development Branch. Technical memorandum, 1993, No.93-04, 4p. + figs.**

Pavements, Bitumens, Sealing, Protective coatings, Waterproofing, Cold weather operation, Winter maintenance, Road maintenance, Canada—Alberta

## 53-1846

**New Brunswick river ice manual. Fredericton, New Brunswick Department of the Environment, Aug. 1989, 18p., 31 refs. With 18p. French version separately paged.**

River ice, Ice conditions, Freezep, Ice breakup, Ice conditions, Ice jams, Ice forecasting, Ice control, Flood forecasting, Canada—New Brunswick

53-1847

Use of polymer modification for emulsion chip seals under inclement conditions.

Holleran, G., Conference on Asphalt Pavements for Southern Africa, Manzini, Swaziland, June 5-9, 1989. Proceedings, Manzini, Swaziland, Executive Committee CAPSA, 1989, p. VI/13-VI/20, 11 refs. Pavements, Bitumens, Polymers, Surfactants, Protective coatings, Sealing, Waterproofing, Cold weather performance, Road maintenance, Australia

53-1848

Ice coring operation and a preliminary observation of ice core taken at the Chongce Ice Cap, west Kunlun Mountains, China.

Zhang, W.C., Han, J.K., Nakawo, M., Japan-China International Symposium on the Study of the Mechanism of Desertification, Tsukuba, Japan, Mar. 2-4, 1993. Proceedings, Tokyo, Japan, Science and Technology Agency, Research and Development Bureau, 1994, p.36-43, 6 refs.

Mountain glaciers, Ice coring drills, Ice cores, Ice dating, Glacier ice, Firn stratification, Dust, Paleoclimatology, China—Kunlun Mountains

53-1849

Contribution of chronic exposure of facial, head, and neck regions to cold acclimation.

Biren, G.B., Philadelphia, PA, Temple University, 1998, 154p., University Microfilms order No.9826143, Ph.D. thesis. Refs. p.113-121. Cold exposure, Physiological effects, Acclimatization

53-1850

Estimating the response of the sea ice-ocean-atmosphere system to paleoclimatic orbital variations using numerical models.

Vavrus, S.J., Madison, University of Wisconsin, 1997, 210p., University Microfilms order No.9803435, Ph.D. thesis. Refs. passim. Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air ice water interaction, Ice cover effect, Ice heat flux, Global change, Paleoclimatology, Ice age theory, Ice models, Mathematical models, Computerized simulation

53-1851

Study of ice microphysical and dynamical processes in a deep cyclonic Front Range winter storm.

Johnson, D.E., Madison, University of Wisconsin, 1997, 265p., University Microfilms order No.9737011, Ph.D. thesis. Refs. p.253-265. Snowstorms, Atmospheric disturbances, Fronts (meteorology), Supercooled clouds, Cloud physics, Ice nuclei, Freezing nuclei, Ice crystal growth, Ice crystal structure, Snow pellets, Computerized simulation, Mathematical models, United States—Colorado—Front Range

53-1852

Palsa formation: mathematical modelling and field information.

An, W.D., Québec, Université Laval, 1997, 202p. + append., National Library of Canada, Ottawa, Canadian theses NQ-26040, Ph.D. thesis. Refs. p.134-150.

Frost mounds, Peat, Periglacial processes, Soil freezing, Frost heave, Ice lenses, Frozen ground thermodynamics, Permafrost origin, Permafrost hydrology, Permafrost thermal properties, Permafrost heat balance, Paleoclimatology, Climatic factors, Mathematical models, Computer programs, Canada—Québec—Kangisualujuaq

53-1853

Evaluation and improvement of frost durability of clay bricks.

Koroth, S.R., Montreal, Concordia University, 1997, 223p., National Library of Canada, Ottawa, Canadian theses NQ-25926, Ph.D. thesis. Refs. p.197-201. Bricks, Clays, Buildings, Frost action, Frost resistance, Frost protection, Cold weather construction, Cold weather tests, Freeze thaw tests, Canada

53-1854

Ice forces on a multifaceted conical structure.

Wang, Z.G., St. John's, Memorial University of Newfoundland, 1997, 263p., National Library of Canada, Ottawa, Canadian theses NQ-25779, Ph.D. thesis. Refs. p.229-235.

Offshore structures, Pressure ridges, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice over-ride, Ice pileup, Ice cracks, Ice breaking, Environmental tests, Computerized simulation, Mathematical models

53-1855

Centrifuge modelling of ice scour in sand.

Hynes, F.G., St. John's, Memorial University of Newfoundland, 1996, 179p., National Library of Canada, Ottawa, Canadian theses MQ-25852, M.Eng. thesis. Refs. p.122-128.

Icebergs, Pressure ridges, Ice bottom surface, Ocean bottom, Underground pipelines, Ice scoring, Ice erosion, Ice loads, Ice friction, Environmental tests, Penetration tests

53-1856

Strategy for monitoring glaciers.

Fountain, A.G., Krimmel, R.M., Trabant, D.C., U.S. Geological Survey. Circular, 1997, No.1132, 19p., 76 refs.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial hydrology, Data processing, United States

53-1857

SAR remote sensing algorithms for automated extraction of sea ice ridges and leads.

Vesceky, J.F., Daida, J.M., Ann Arbor, University of Michigan, Atmospheric, Oceanic, and Space Science Department, 1997, 8p. + append., ADA-330 060, Refs. passim. Supported by U.S. Office of Naval Research Grant N00014-92-J-6005.

Ice surveys, Sea ice distribution, Ice conditions, Ice openings, Ice surface, Pressure ridges, Ice detection, Ice reporting, Synthetic aperture radar, Spaceborne photography, Image processing

53-1858

Antarctic Treaty exchange of information in accordance with Articles III(1) & VII(5) and Recommendation VIII(6). Belgian Antarctic activities planned for 1998-1999.

Belgium. Prime Minister's Services. Federal Office for Scientific, Technical and Cultural Affairs (OSTC), Brussels, 1998, 10p.

Research projects, Ecosystems, Global change, Ocean currents, Sea ice, Ice cover, Marine deposits, Ecology, Paleocology, Oceanographic surveys, Marine biology, Nutrient cycle, Plant physiology, Antarctica

53-1859

Interpretation of airborne radar imagery in a mountainous area for snow-cover study. [Interprétation en nivologie de l'imagerie radar aéroportée en zone de montagne (Les Arcs, Alpes françaises)]

Fily, M., Dedieu, J.P., Société Française de Photogrammétrie et de Télédétection. Bulletin, Jan. 1993, No.129, p.4-8, In French with English summary. 9 refs.

DLC TR693.S6a 1993

Spaceborne photography, Imaging, Image processing, Radiometry, Snow cover distribution, Snow air interface, Snow cover structure, France—Alps

53-1860

Enhanced snow-cover classification in satellite images using GIS data.

Pennati, G.P., Bonasoro, M., Menajovsky, S., Rossi, G.C., Société Française de Photogrammétrie et de Télédétection. Bulletin, Jan. 1993, No.129, p.18-23, With French summary. 9 refs.

DLC TR693.S6a 1993

Spaceborne photography, Imaging, Remote sensing, Snow cover, Classifications, LANDSAT, Hydrology, Models, Snow hydrology, Snow morphology, Snow cover distribution, Runoff forecasting, Italy—Alps

53-1861

Integrated GIS for the study of alpine glaciers.

Rampini, A., Société Française de Photogrammétrie et de Télédétection. Bulletin, Jan. 1993, No.129, p.24-28, With French summary. 16 refs.

DLC TR693.S6a 1993

Spaceborne photography, Image processing, Remote sensing, Mountain glaciers, Glaciology, Data processing, Imaging, Glacier surveys, Glacier mass balance, Glacial hydrology, Italy—Alps

53-1862

Photogrammetry for the evaluation of hazards resulting from snow cover. [Utilisation de la photogrammétrie pour l'évaluation des dangers présentés par une couverture neigeuse]

Kölbl, O., Castelle, T., Société Française de Photogrammétrie et de Télédétection. Bulletin, Jan. 1993, No.129, p.35-46, In French with English summary. 4 refs.

DLC TR693.S6a 1993

Photogrammetric surveys, Aerial surveys, Snow cover structure, Safety, Photogrammetry, Photographic techniques, Measurement, Photographic equipment, Imaging, Photointerpretation, Snow cover stability, Avalanche forecasting

53-1863

TISS: a system for multispectral rendering of mountainous landscape.

Brivio, P.A., Société Française de Photogrammétrie et de Télédétection. Bulletin, Jan. 1993, No.129, p.47-54, With French summary. Refs. p.53-54.

DLC TR693.S6a 1993

Spaceborne photography, Image processing, Imaging, Alpine landscapes, Fractals, Simulation, Topographic surveys, Terrain identification, Italy—Alps

53-1864

Relationship between recent planktic foraminifera and water mass properties in the western Ross Sea (Antarctica).

Asioli, A., Langone, L., Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria, 1997, 20(2), Convegno Nazionale di Glaciologia Antarctica, Padua, Italy, June 11-12, 1996. Selected papers, p.193-198, With Italian summary. 24 refs.

Marine biology, Ecosystems, Biomass, Plankton, Chlorophylls, Classifications, Structural analysis, Water chemistry, Hydrography, Sampling, Antarctica—Ross Sea

53-1865

Possible sources and origins of lead in present-day east antarctic snow.

Barbante, C., et al, Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria, 1997, 20(2), Convegno Nazionale di Glaciologia Antarctica, Padua, Italy, June 11-12, 1996. Selected papers, p.199-202, With Italian summary. 19 refs.

Climatology, Polar atmospheres, Air pollution, Snow impurities, Aerosols, Sedimentation, Hydrocarbons, Fuel additives, Origin, Sampling, Environmental tests, Seasonal variations, Antarctica—Victoria Land

53-1866

Review of antarctic geomorphological mapping.

Baroni, C., Bruschi, G., López-Martínez, J., Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria, 1997, 20(2), Convegno Nazionale di Glaciologia Antarctica, Padua, Italy, June 11-12, 1996. Selected papers, p.203-218, With Italian summary. Refs. p.214-218.

Geomorphology, Geophysical surveys, Glacier surveys, Ice surveys, Geological maps, Mapping, Classifications, Accuracy, Correlation, Antarctica

53-1867

Geomorphological sketch map of the Mount Dickason area (Victoria Land, Antarctica) mapped by aerial photographs.

Biasini, A., Osso, P., Salvatore, M.C., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), Convegno Nazionale di Glaciologia Antartica, Padua, Italy, June 11-12, 1996. Selected papers, p.219-223, With Italian summary. 19 refs.

Geomorphology, Mountains, Glacier surveys, Geological surveys, Mapping, Photogeology, Antarctica—Dickason, Mount

53-1868

Analysis of extreme temperature in Terra Nova Bay, Antarctica.

Brancucci, G., Silvestro, M., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), Convegno Nazionale di Glaciologia Antartica, Padua, Italy, June 11-12, 1996. Selected papers, p.225-232, With Italian summary. 7 refs.

Climatology, Polar atmospheres, Air temperature, Temperature variations, Seasonal variations, Meteorological data, Statistical analysis, Mathematical models, Antarctica—Terra Nova Bay

53-1869

Some observations on snowpack features in northern Victoria Land, Antarctica.

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Snow surveys, Snow physics, Snow cover structure, Snow cover stability, Snow density, Grain size, Profiles, Sampling, Antarctica—Victoria Land

53-1870

Chemical profiles from snow pits and shallow firn cores and snow accumulation on Campbell Glacier (northern Victoria Land, Antarctica).

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Glacier surveys, Snow surveys, Snow composition, Snow accumulation, Firn, Chemical composition, Profiles, Sampling, Ion density (concentration), Drill core analysis, Seasonal variations, Antarctica—Campbell Glacier

53-1871

First results of sedimentological and geotechnical determinations on Joides basin cores in relation to the Pleistocene grounding line.

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Pleistocene, Geological surveys, Marine geology, Glacial geology, Ice sheets, Sedimentation, Grounded ice, Ice edge, Drill core analysis, Profiles, Antarctica—Ross Sea

53-1872

Isotopic composition of snow samples from northern Victoria Land (Antarctica) and correlations with geographical factors.

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Snow surveys, Snow composition, Oxygen isotopes, Altitude, Drift, Topographic effects, Sampling, Isotope analysis, Correlation, Antarctica—Victoria Land

53-1873

Thermal conductivity measurement (TCM) of ice cores: devices and procedures.

Festa, C., Rossi, A., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), Convegno Nazionale di Glaciologia Antartica, Padua, Italy, June 11-12, 1996. Selected papers, p.263-267, With Italian summary. 12 refs.

Glaciology, Glacier ice, Ice cores, Drill core analysis, Thermal conductivity, Probes, Temperature measurement, Models, Antarctica

53-1874

Ion chromatographic method for monitoring sulphate in ice-cores.

Gragnani, R., Torcini, S., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), Convegno Nazionale di Glaciologia Antartica, Padua, Italy, June 11-12, 1996. Selected papers, p.269-270, With Italian summary. 5 refs.

Glaciology, Glacier ice, Ice cores, Chemical composition, Snow impurities, Aerosols, Volcanic ash, Ions, Chemical analysis, Measuring instruments, Antarctica—Campbell Glacier

53-1875

GPS-assisted photogrammetry for mapping production in Antarctica.

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Glacier surveys, Photogrammetric surveys, Aerial surveys, Sensor mapping, Data processing, Image processing, Antarctica—Victoria Land

53-1876

Climatic stages control on grain-size clusters in core ANTA91-8 (Ross Sea).

Quaia, T., Brambati, A., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), Convegno Nazionale di Glaciologia Antartica, Padua, Italy, June 11-12, 1996. Selected papers, p.279-282, With Italian summary. 17 refs.

Pleistocene, Paleoclimatology, Climatic changes, Glacial geology, Marine geology, Sedimentation, Glacial deposits, Grain size, Lithology, Drill core analysis, Antarctica—Ross Sea

53-1877

Geomorphological sketch map of the Evans Cove area (Victoria Land, Antarctica).

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Geomorphology, Landforms, Mapping, Geological surveys, Glacier surveys, Spaceborne photography, Geodetic surveys, Correlation, Classifications, Antarctica—Victoria Land

53-1878

Changes in the number and area of Italian alpine glaciers between 1958 and 1989.

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Glacier surveys, Aerial surveys, Mountain glaciers, Alpine glaciation, Glacier oscillation, Ice volume, Seasonal variations, Slope orientation, Statistical analysis, Italy—Alps

53-1879

Glaciers (vedrette) of the Dolomitic Group of Brenta (Alps): one hundred and thirty years of trips and observations. [I ghiacciai (vedrette) delle Dolomiti di Brenta: centotrent'anni de frequentazione e di osservazioni]

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Glacier surveys, Mountain glaciers, Alpine glaciation, Glacier mass balance, Glacier oscillation, Climatic factors, Seasonal variations, Italy—Alps

53-1880

Calderone Glacier (Gran Sasso d'Italia). Determination of ice thickness and bedrock morphology by means of radio-echo sounding.

Fiucci, A., Gigante, B., Rossi, C., Smiraglia, C., Veggetti, O., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), p.305-308, With Italian summary. 8 refs.

Glacier surveys, Mountain glaciers, Glacier thickness, Bedrock, Topographic features, Radio echo soundings, Profiles, Italy—Apennines

53-1881

Kinematic wave theory: a priority of the Italian Glaciology (De Marchi, 1895).

Mazza, A., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), p.309-314, With Italian summary. 24 refs.

Glacier oscillation, Ice mechanics, Glacier surfaces, Elastic waves, Wave propagation, Velocity, Climatic factors, Analysis (mathematics), Theories, Computerized simulation

53-1882

Ice structure and dynamics of the Jumeaux Glacier, Valtournanche, Aosta Valley, Italy.

Motta, L., Motta, M., *Comitato glaciologico italiano. Bollettino. Ser.3: Geografia fisica e dinamica quaternaria*, 1997, 20(2), p.315-320, With Italian summary. 18 refs.

Glacier surveys, Mountain glaciers, Alpine glaciation, Glacier ice, Glacier flow, Ice structure, Ice composition, Firn stratification, Classifications, Thin sections, Italy—Alps

53-1883

Geomorphological map of the Valle Desertetto (Maritime Alps) and explanatory notes. [Carta geomorfologica della Valle Desertetto (Alpi Marittime) e note illustrative]

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Geomorphology, Geological maps, Alpine landscapes, Glacial geology, Slope processes, Cirques, Moraines, Landforms, Italy—Alps

53-1884

Response time of the Lys Glacier (Valle d'Aosta). An example of a dendrogeomorphological and environmental study.

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Climatology, Air temperature, Glacier surveys, Mountain glaciers, Glacier oscillation, Climatic factors, Trees (plants), Age determination, Statistical analysis, Correlation, Seasonal variations, Italy—Alps

53-1885

Holocene variations of the Yanzigou Glacier (Gongga Shan Massif, Da Xueshan, China).

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Glacier surveys, Mountain glaciers, Glacial geology, Glacier oscillation, Moraines, Quaternary deposits, Radioactive age determination, Geochronology, China—Tibet

53-1886

Fall of the front of the Grandes Jorasses Glacier (Mont Blanc) occurred between 30 and 31 May 1998. [Crollo della fronte del ghiacciaio sommitale delle Grandes Jorasses (Monte Bianco) il 30-31 Maggio 1998]

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Mountain glaciers, Glacier surveys, Alpine glaciation, Ice deterioration, Icefalls, Permafrost distribution, Permafrost transformation, France—Mont Blanc

53-1887

Reports on the Glaciological Survey of 1996.

[Relazioni della Campagna Glaciologica 1996]

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Glacier surveys, Alpine glaciation, Mountain glaciers, Glacier oscillation, Glacier mass balance, Seasonal variations, Ice edge, Italy—Alps

53-1888

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Oceanographic surveys, Paleoclimatology, Glacial deposits, Paleobotany, Marine biology, Nutrient cycle, Periodic variations, Marine deposits, Bottom sediment

53-1889

Millennial-scale iceberg discharges in the Irminger Basin during the last glacial period: relationship with the Heinrich events and environmental settings.

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Paleoclimatology, Glaciation, Marine geology, Icebergs, Ice air interface, Glacier melting, Glacial geology

53-1890

Biodeterioration of rocks by lichens in hostile arctic environments studied by FT-Raman spectroscopy.

Edwards, H.G.M., Holder, J.M., Russell, N.C., Wynn-Williams, D.D., Spectroscopy of biological molecules: modern trends. Edited by P. Carmona, R. Navarro, and A. Hernandez. Proceedings, Dordrecht, Netherlands, Kluwer Academic Publishers, 1997, p.509-510, 6 refs.

DLC QP519.9.S6S646 1997

Frozen rocks, Rock properties, Low temperature research, Lichens, Plant physiology, Spectroscopy, Weathering, Antarctica

53-1891

Inorganic chemical analysis of major rivers flowing into the Bay of Fundy, Scotian Shelf and Bras d'Or Lakes.

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53-1892

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53-1893

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Exploration, Geological surveys, Geochemistry, Minerals, Natural resources, United States—Alaska

53-1894

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Petroleum industry, Economic development, Regional planning, Research projects, Bibliographies, Data processing, Canada

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53-1897

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53-1898

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53-1899

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Pleistocene, Paleoclimatology, Climatic changes, Precipitation (meteorology), Humidity, Mountains, Insolation, Albedo, Radiation balance, Snow cover effect, Ice cover effect, Ice age theory, Chile—Andes

53-1900

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Pleistocene, Paleoclimatology, Polar atmospheres, Climatic changes, Snow accumulation, Surface temperature, Atmospheric circulation, Ice sheets, Ice air interface, Topographic effects, Ice cores, Simulation, Antarctica, Greenland

53-1901

Incoherent scatter radar observations of horizontal *F* region plasma structure over Sondrestrom, Greenland, during polar cap patch events.

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Atmospheric physics, Atmospheric electricity, Electric fields, Polar atmospheres, Radio echo soundings, Scattering, Profiles, Ionization, Ion density (concentration), Statistical analysis, Greenland—Sondrestrom

53-1902

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Atmospheric physics, Polar atmospheres, Atmospheric electricity, Electric fields, Ionization, Gravity waves, Radio echo soundings, Convection, Velocity measurement, Simulation, Canada—Northwest Territories—Eureka

53-1903

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Atmospheric physics, Polar atmospheres, Geomagnetism, Atmospheric electricity, Electric fields, Ionization, Ion density (concentration), Solar radiation, Radio echo soundings, Correlation, Diurnal variations, Russia—Dickson Island, Antarctica—Mirnyy Station, Antarctica—Vostok Station

53-1904

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53-1905

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53-1906

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Ice mechanics, Sea ice, Ice strength, Floating ice, Ice cracks, Crack propagation, Projectile penetration, Ice solid interface, Dynamic loads, Plastic deformation, Stress concentration, Statistical analysis, Mathematical models

53-1907

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Climatology, Marine atmospheres, Surface temperature, Temperature variations, Atmospheric circulation, Heat flux, Advection, Air water interactions, Sea ice distribution, Seasonal variations, Mathematical models, Antarctica

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## 53-1909

**Intercomparison of simulated global vegetation distributions in response to 6 kyr BP orbital forcing.**

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Paleoclimatology, Climatic changes, Global warming, Insolation, Snow cover distribution, Sea ice distribution, Paleoecology, Vegetation patterns, Tundra vegetation, Temperature effects, Simulation, Maps, Models

## 53-1910

**Sea ice effects on the sensitivity of the thermohaline circulation.**

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Climatology, Boundary layer, Marine atmospheres, Surface temperature, Ocean currents, Salinity, Turbulent diffusion, Sea ice distribution, Ice cover effect, Air ice water interaction, Heat balance, Mathematical models, Thermodynamics

## 53-1911

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Climatology, Atmospheric circulation, Air temperature, Global change, Winter, Temperature variations, Snow air interface, Snow depth, Snow cover distribution, Snow cover effect, Surface temperature, Mathematical models, Simulation, Eurasia

## 53-1912

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## 53-1913

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Ice physics, Ice structure, Water structure, Ice dielectrics, Self diffusion, Polarization (charge separation), Molecular structure, Aggregates, Orientation, Molecular energy levels, Computerized simulation

## 53-1914

**Climatic soil freezing modeled in centrifuge.**

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Frozen ground mechanics, Frost heave, Soil freezing, Thermal regime, Freeze thaw cycles, Ice formation, Thin sections, Stress concentration, Mechanical tests, Simulation, Accuracy

## 53-1915

**Program and abstracts. International cooperation in arctic research: detecting global change and its impacts in the western Arctic.**

Arctic Science Conference, 49th/IARC (University of Alaska Fairbanks International Arctic Research Center) Inauguration, Fairbanks, AK, Oct. 25-28, 1998, Fairbanks, American Association for the Advancement of Science, Arctic Division, 1998, 214p. Research projects, International cooperation, Polar atmospheres, Global warming, Air ice water interaction, Paleoclimatology, Environmental impact, Regional planning

## 53-1916

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## 53-1917

**Glaciers of the Swiss Alps 1991/92 and 1992/93. [Die Gletscher der Schweizer Alpen 1991/92 und 1992/93]**

Herren, E.R., Hoelzle, M., *Schweizerische Akademie der Naturwissenschaften. Glaziologische Kommission. Jahrbuch. Bericht*, 1998, No.113/114, 114p., In German and French with English table of contents and summary. 37 refs.

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## 53-1918

**Circulation on the north central Chukchi Sea shelf.**

Weingartner, T.J., Fairbanks, University of Alaska, Coastal Marine Institute, June 1998, 39p., 34 refs. OCS study MMS 98-0026 funded in part by the U.S. Minerals Management Service, Alaska Outer Continental Shelf Region and University of Alaska Fairbanks.

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Ice water interface, Ice edge, Polynyas, Sea ice distribution, United States—Alaska, Chukchi Sea

## 53-1919

**Comparisons between petroleum systems in the Arctic National Wildlife Refuge, Alaska.**

Baner, A.C., Jr., Mowatt, T.C., *U.S. Bureau of Land Management. Alaska State Office, Anchorage. BLM-Alaska technical report*, Sep. 1998, No.18, 22p., 48 refs.

Exploration, Geological surveys, Stratigraphy, Tectonics, Crude oil, Natural gas, Natural resources, United States—Alaska—Arctic National Wildlife Refuge

## 53-1920

**Development and demonstration of FRP composite fender, loadbearing, and sheet piling systems.**

Lampo, R.G., et al, MP 5270, *U.S. Army Construction Engineering Research Laboratories, Champaign, IL. Technical report*, Sep. 1998, USACERL TR 98/123, Construction Productivity Advancement Research (CPAR) Program, 81p. + append., Refs. p.79-81.

Composite materials, Polymers, Piles, Pile structures, Piers, Wharves, Low temperature tests, Structural analysis, Pile load tests. Traditional piling systems are inherently unsuited for harsh waterfront environments. Deterioration of wood, concrete, and steel piling systems is estimated to cost the U.S. military and civilian marine and waterfront communities over \$1 billion annually. Fiber-reinforced polymer (FRP) composites represent an alternative construction material without many of the performance disadvantages of traditional materials as described above. A proposal was submitted to develop composite piling systems under the U.S. Army Corps of Engineers' Construction Productivity Advancement Research (CPAR) Program. This CPAR Project developed, tested, and demonstrated high-performance polymer composite fender, load-bearing, and sheet pile (bulkheads) systems for marine/waterfront civil engineering applications. In phase one, mechanical, operating, and physical performance requirements were established. In phase two, laboratory tests were conducted to assess the preliminary designs. Promising designs were further developed and tested. Selected fender piles that met the established requirements, as determined by

the laboratory tests, were installed in a field demonstration. Development and adoption of industry consensus specifications and standards for composite piling systems was initiated. The Composites Institute and member manufacturers have promoted and will continue to promote the commercialization of the composite piling systems developed under this project.

## 53-1921

**Engineering and design. Runoff from snowmelt.**

U.S. Army Corps of Engineers, Pangburn, T., MP 5271, *Engineer manual*, Mar. 31, 1998, EM 1110-2-1406, Var. p., Refs. p.A/1-A/9.

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## 53-1922

**Temperature dependent multiphase flow and transport.**

Sykes, J.F., Merry, A.G., Zhu, J., International Conference on Computational Methods in Water Resources, 12th, Crete, Greece, June 1998. Proceedings, Vol.2: Computational methods in surface and ground water transport. Edited by V.N. Burganos, G.P. Karatzas, A.C. Payatakes, C.A. Brebbia, W.G. Gray and G.F. Pinder, Southampton, UK and Boston, MA, USA, Computational Mechanics Publications, Computational Mechanics, Inc., 1998, p.19-26, 4 refs.

DLC GB656.2.E43C65 1998 Vol.2

Soil temperature, Frozen ground, Freeze thaw cycles, Mathematical models, Mass transfer, Fluid flow

## 53-1923

**Comparative approach to the entomological diversity of polar regions.**

Vernon, P., Vannier, G., Trehen, P., *Acta oecologica*, May/June 1998, 19(3), p.303-308, 81 refs.

Climate, Animals, Environments, Biogeography, Cold tolerance, Iceland, Norway—Svalbard, Canada—Northwest Territories—Bathurst Island, Antarctica

## 53-1924

**Snow density measurement using acoustic properties. [Mesure de la densité de la neige à partir de ses propriétés acoustiques]**

Marco, O., Villemain, P., Touvier, F., *La houille blanche*, Dec. 1998, No.5/6, p.117-123, In French with English summary. 27 refs.

Snow density, Snow acoustics, Porosity, Mathematical models, Wave propagation, Sound waves

## 53-1925

**Deep coring on the Lys Glacier (Monte Rosa): first results. [Carottage profond sur le glacier du Lys (Monte Rosa): résultats préliminaires]**

Rossi, G., Novo, A., Maggi, V., Orombelli, G., Smiraglia, C., *La houille blanche*, Dec. 1998, No.5/6, p.124-127, In French with English summary. 5 refs.

Glaciers, Radiometry, Isotope analysis, Ice density, Ice cores, Glacier oscillation, Italy—Monte Rosa, Italy—Lys Glacier

## 53-1926

**Innovative concepts for preventive maintenance.**

Galehouse, L., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.1-6, 4 refs.

Pavements, Road maintenance, Highway planning, Cost analysis, United States—Michigan

## 53-1927

**Joint seal practices in the United States: observations and considerations.**

Morian, D.A., Stoffels, S., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.7-12, 12 refs.

Pavements, Joints (junctions), Sealing, Waterproofing, Weatherproofing, Cold weather performance, Road maintenance, United States

53-1928

Laboratory investigation of factors affecting bond strength in joint sealants.

Gurjar, A., Kim, H.B., Moody, E., Buch, N.J., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.13-21, 7 refs.

Concrete pavements, Concrete aggregates, Joints (junctions), Sealing, Waterproofing, Weatherproofing, Cold weather performance, Road maintenance

53-1929

Pavement pressure generation: neglected aspect of jointed pavement behavior.

Burke, M.P., Jr., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.22-28, 9 refs.

Bridges, Pavements, Joints (junctions), Sealing, Thermal stresses, Road maintenance

53-1930

Winter road condition recognition using video image classification.

Kuehnle, A., Burghout, W., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.29-33, 7 refs.

Road icing, Ice detection, Photographic techniques, Photographic reconnaissance, Image processing, Data transmission, Weather observations, Weather forecasting, Warning systems, Safety, Road maintenance, Sweden

53-1931

Road snow removal and the snowfall information system in the city of Sapporo.

Kanemura, N., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.34-40. Snowfall, Urban planning, Streets, Weather observations, Weather forecasting, Data transmission, Snow removal, Road maintenance, Japan—Hokkaido

53-1932

Life cycle cost-benefit model for road weather information systems.

McKeever, B., Haas, C., Weissmann, J., Greer, R., *Transportation research record*, 1998, No.1627, Pavement and winter maintenance, p.41-48, 14 refs. Road icing, Ice detection, Highway planning, Weather observations, Weather forecasting, Data transmission, Warning systems, Road maintenance, Cost analysis, United States—Texas

53-1933

Physical evaluation of a hail suppression project with silver iodide ground burners in southwestern France.

Dessens, J., *Journal of applied meteorology*, Dec. 1998, 37(12), p.1588-1599, 36 refs. Climatology, Precipitation (meteorology), Weather modification, Hail prevention, Cloud seeding, Silver iodide, Aerosols, Smoke generators, Hailstones, Statistical analysis, Performance, France

53-1934

Correction of three-dimensional effects for passive microwave remote sensing of convective clouds.

Bauer, P., Schanz, L., Roberti, L., *Journal of applied meteorology*, Dec. 1998, 37(12), p.1619-1632, 22 refs.

Precipitation (meteorology), Cloud physics, Radiometry, Imaging, Sensors, Orientation, Resolution, Scattering, Brightness, Ice detection, Radiation balance, Mathematical models

53-1935

Contributions on mountain geomorphology. [Beiträge aus der Gebirgs-Geomorphologie]

Vischer, D., ed. *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, 226p., In German, English or French. Refs. passim. For selected papers see 53-1936 through 53-1952.

Periglacial processes, Permafrost distribution, Permafrost indicators, Rock glaciers, Slope stability, Alpine glaciation, Glacial geology, Glacial deposits, Soil dating, Paleoclimatology, Switzerland

53-1936

Monitoring rockwall instability in the Murtèl-Corvatsch region, Upper Engadin.

Matsuoka, N., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.7-14, With German summary. 14 refs. Rock glaciers, Slope stability, Frost weathering, Frost shattering, Talus, Landslides, Switzerland

53-1937

Debris flows in Val Bever, Upper Engadin—a hazard analysis. [Murgänge im Val Bever, Oberengadin—eine Gefahrenanalyse]

Bommer, M., Kneisel, C., Tressel, E., Baumhauer, R., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.15-23, In German with English summary. 11 refs. Railroad tunnels, Mudflows, Slope stability, Avalanche forecasting, Landslide control, Switzerland

53-1938

Firn and ice temperatures in the Alps. [Firn- und Eistemperaturen in den Alpen]

Suter, S., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.24-41, In German with English summary. 34 refs.

Glacier surveys, Firn, Glacier ice, Ice temperature, Temperature distribution, Glacier heat balance, Boreholes, Alps

53-1939

Soil mapping in the study area of Gemmi (Wallis Alps) by geomorphological methods. [Bodenkartierungen im Untersuchungsgebiet der Gemmi (Walliser Alpen) mit Hilfe geomorphologischer Methoden]

Döbeli, C., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.42-54, In German with English summary. 14 refs.

Mountain soils, Soil surveys, Soil mapping, Soil classification, Switzerland

53-1940

Permafrost studies with GIS. A study in the Fletschhorn region. [Permafrostuntersuchungen mit GIS. Eine Studie im Fletschhorngebiet]

Frauenfelder, R., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.55-68, In German with English summary. 11 refs.

Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Periglacial processes, Computerized simulation, Switzerland

53-1941

Geomorphological maps of the pre-Alps and Vaud Alps. Computer-assisted drafting (dessin assisté par ordinateur) procedure. [Cartes géomorphologiques des Préalpes et des Alpes vaudoises. Procédure d'édition par DAO]

Schoeneich, P., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.69-74, In French with English summary. 4 refs.

Topographic surveys, Topographic maps, Mapping, Terrain identification, Environment simulation, Image processing, Computer applications, Switzerland

53-1942

Rock glaciers of Entremont (Valais Alps): inventory and spatial analysis by GIS. [Les glaciers rocheux de la région d'Entremont (Alpes Valaisannes): inventaire et analyse spatiale à l'aide d'un SIG]

Delaloye, R., Morand, S., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.75-86, In French with English summary. 22 refs.

Rock glaciers, Permafrost indicators, Discontinuous permafrost, Permafrost distribution, Periglacial processes, Paleoclimatology, Computerized simulation, Switzerland

53-1943

High alpine lake sediments as evidence of a late to early postglacial glacier history in Upper Engadin. [Hochalpine Seesedimente als Zeugnisse der spät- bis früh postglazialen Gletschergeschichte im Oberengadin]

Ohlendorf, C., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.87-97, In German with English summary. 32 refs.

Alpine glaciation, Glacial geology, Glacial deposits, Glacial lakes, Lacustrine deposits, Stratigraphy, Soil dating, Paleoclimatology, Switzerland

53-1944

Inn/Flaz flood protection project. [Das Hochwasserschutzprojekt Inn/Flaz]

Herzog, B., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.98-110, In German with English summary.

River flow, Dams, Flood forecasting, Flood control, Switzerland

53-1945

Discovery trails on climate change in Upper Engadin. Teaching aid on the complex natural sciences problem. [Erlebnislehrpfad zur Klimaveränderung im Oberengadin. Zur Didaktik komplexer naturwissenschaftlicher Probleme]

Arn, D., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.111-120, In German with English summary. 13 refs.

Climatic changes, Human factors, Environmental impact, Environmental protection, Education, Switzerland

53-1946

Surface kinematics of selected rock glaciers in Upper Engadin. [Oberflächenkinematik ausgewählter Blockgletscher des Oberengadins]

Käab, A., *Zürich. Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.121-140, In German with English summary. 22 refs.

Rock glaciers, Slope processes, Periglacial processes, Permafrost indicators, Permafrost distribution, Solifluction, Soil creep, Climatic changes, Switzerland



## 53-1947

Association and characteristics of surface and ground ice respectively. Permafrost in glacier forefields that have recently become ice free: basic study from preliminary results in Upper Engadin. [Vergesellschaftung und Charakteristiken von Oberflächen- und Untergrunds bzw. Permafrost in jüngst eisfrei gewordenen Gletschervorfeldern: eine Grundlagenstudie mit ersten Ergebnissen aus dem Oberengadin]

Kneisel, C., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.141-151, In German with English summary. 30 refs.

Alpine glaciation, Cirque glaciers, Periglacial processes, Permafrost indicators, Permafrost distribution, Ground ice, Fossil ice, Switzerland

## 53-1948

Energy balance over alpine permafrost. [Energiebilanz über alpinem Permafrost]

Mittaz, C., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.152-167, In German with English summary. 20 refs.

Rock glaciers, Periglacial processes, Permafrost heat transfer, Permafrost heat balance, Permafrost distribution, Soil air interface, Switzerland

## 53-1949

Engineering geology and alpine permafrost in Switzerland. [Geotechnik und Alpiner Permafrost in der Schweiz]

Arenson, L., Springman, S.M., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.168-177, In German with English summary. 38 refs.

Permafrost beneath structures, Permafrost preservation, Permafrost control, Frozen ground strength, Soil creep, Slope stability, Soil stabilization, Engineering geology, Switzerland

## 53-1950

Laboratory studies on debris flow initiation. [Laboruntersuchungen zur Murgangentstehung]

Tognacca, C., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.178-191, In German with English summary. 12 refs.

Mudflows, Avalanche formation, Avalanche modeling, Avalanche erosion, Sediment transport, Environmental tests

## 53-1951

Late glacial stades of the Vaud pre-Alps and their correlation with the model of the eastern Alps. [Les stades tardiglaciaires des Préalpes vaudoises et leur corrélation avec le modèle des Alpes orientales]

Schoeneich, P., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.192-206, In French with English summary. 11 refs.

Alpine glaciation, Glacial geology, Glacier oscillation, Glacial deposits, Moraines, Geochronology, Soil dating, Paleoclimatology, Alps

## 53-1952

Timing of the late Holocene debris supply and glacial fluctuations in Langtang Himal, central Nepal Himalaya.

Watanabe, T., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No. 158, Beiträge aus der Gebirgs-Geomorphologie (Contributions on mountain geomorphology). Edited by D. Vischer, p.207-216, With German summary. 11 refs. Alpine glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Landslides, Avalanche deposits, Talus, Soil dating, Geochronology, Paleoclimatology, Nepal

## 53-1953

Proceedings of the 51st annual Eastern Snow Conference, Dearborn, MI, June 15-16, 1994.

Eastern Snow Conference, Albert, M.R., Taylor, S., MP 5272, 1994, 173p., Refs. passim. For selected papers see 53-1954 through 53-1970.

Snow surveys, Snowfall, Snow cover distribution, Snow depth, Snow cover effect, Snow hydrology, Snow water equivalent, Snowmelt, Weather forecasting, Runoff forecasting

## 53-1954

Sensitivity of the arctic climate system to snowfall: evidence from the Canadian high Arctic.

Brown, R.D., Goodison, B.E., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.1-10, 19 refs. Polar atmospheres, Marine atmospheres, Snowfall, Snow cover effect, Snow ice interface, Snow air interface, Snow heat flux, Air ice water interaction, Sea ice, Freezeup, Ice breakup, Ice conditions, Ice heat flux, Global warming, Computerized simulation, Canada—Northwest Territories—Arctic Archipelago

## 53-1955

Diagnosing the impacts of the Great Lakes on an Alberta Clipper.

Mann, G.E., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.11-22, 18 refs. Atmospheric circulation, Atmospheric disturbances, Lake effects, Snowstorms, Snowfall, Synoptic meteorology, Weather forecasting, Great Lakes

## 53-1956

30-year mass balance of a high arctic glacier: perspectives from the White Glacier, Axel Heiberg Island, NWT, Canada.

Ecclestone, M.A., Cogley, J.G., Adams, W.P., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.23-29, 10 refs.

Glacier surveys, Glacier oscillation, Glacier tongues, Glacier mass balance, Snow line, Sea level, Statistical analysis, Canada—Northwest Territories—Axel Heiberg Island

## 53-1957

Analysis of the winter low-flow balance of the semi-arid White River, Nebraska and South Dakota.

Ferrick, M.G., Mulherin, N.D., Calkins, D.J., MP 5273, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.31-43, 19 refs. For other versions see 49-6505 and 50-1074.

River basins, River ice, Ice growth, Ice (water storage), Ice cover effect, River flow, Stream flow, Ground water, Water table, Water balance, Statistical analysis, United States—Nebraska—White River, United States—South Dakota—White River Low-flow studies improve understanding of flow paths during critical base-flow periods and are needed to assess the effects of water consumption on stream flow, water quality, groundwater resources, and contaminant transport. The inflows to a river from its subbasins and corresponding alluvial aquifers in a semi-arid cold region are most readily quantified in winter. The authors investigated the low-flow water balance of eight subbasins of the White River at a monthly time scale over seven consecutive winters. Water going into or out of storage as ice or melt, obtained with a temperature index model, can be a dominant component of the water balance. The point estimate method is used to account for parameter uncertainty and variability, providing the mean, variance and limits of dependent variables such as water storage as ice and inflow from a subbasin. Negative water yield from subbasins of several thousand square kilometers occurred regularly during the period, indicating a significant flow from the river to the alluvial aquifers. The authors discuss the winter water balance by subbasin and between years. The results suggest a perched river or a coupled surface water-groundwater

hydrologic system in particular subbasins, consistent with the field investigations of Rothrock (1942). The winter flow exchange between the surface and subsurface can be used to estimate the annual exchange for both conditions.

## 53-1958

Computation of ice-affected streamflow by use of simulation modeling and error integration.

Holtschlag, D.J., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.45-54, 9 refs.

River ice, Ice water interface, Ice cover effect, River flow, Stream flow, Runoff forecasting, Statistical analysis, Computerized simulation

## 53-1959

Ice formation in an Alaskan estuarine salt marsh.

Taylor, S., Racine, C.H., Collins, C.M., MP 5274, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.55-66, 5 refs.

Estuaries, Floodplains, Wetlands, Ponds, Alluvium, Bottom sediment, Suspended sediments, Ice formation, Ice growth, Bottom ice, Ice cores, Ice salinity, Ice composition, United States—Alaska—Eagle River Flats

An extensive ice sheet builds up during the winter in a salt marsh complex (Eagle River Flats) at the mouth of the Eagle River near Anchorage, AK. Ice cores were taken along a transect beginning in a 0.5-m deep pond along the edge of the salt marsh and traversing marsh, shallow pond and subaerial mudflats closer to the river to elucidate how snow accumulation, periodic tidal flooding and freshwater flow contribute to the ice cover formation. The ice structure and chemistry at Eagle River Flats vary vertically and spatially. Salt and sediment content are correlated, indicating that most of the sediment is deposited by tidal flooding. Generally the ice thickness decreases, and the salt and sediment content increases, with proximity to the river. Except in the deeper pond at the periphery of the Flats, the ice appears to be grounded. The ice builds from the ground upward and thickens when tidal waters flow over the previously flooded, now frozen, surface. The ice appears to be well bonded to the underlying sediment.

## 53-1960

Snowcover identification using the Special Sensor Microwave Imager.

Grody, N.C., Basist, A.N., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.67-74, 10 refs.

Snow surveys, Snow cover distribution, Snowfall, Snow surface temperature, Terrain identification, Radiometry, Spaceborne photography, Image processing

## 53-1961

Local and regional estimation of snow using SNO-TEL.

Gwilliam, B.L., MP 5275, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.75-82, 16 refs.

Snow surveys, Snow cover distribution, Snow hydrology, Snow water equivalent, Snowmelt, Forest canopy, Weather stations, Data processing, Statistical analysis, Runoff forecasting, United States—Arizona—Mogollon Rim

One aspect of snow research is concerned with understanding the spatial distribution of snow. Snow distribution includes the influence of locational attributes such as latitude, longitude, elevation and canopy cover. The 1990 snow data from six USDA Soil Conservation Service Snow Telemetry (SNOTEL) sites on the Mogollon Rim of Arizona provide an opportune case study of snow distribution as a function of locational attributes. Study results show that percent canopy cover effectively describes the variation between the study sites and a derived regional average. Canopy cover is included in a locationally adjusted spatial snow cover model, which provides strong predictive estimates of snow cover as shown by concurrently collected snow course data.

## 53-1962

Commentary on the pitfalls of cleaning snow data.

Jones, V.K., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.83-88, 5 refs.

Snow surveys, Snowfall, Snow depth, Weather observations, Meteorological data, Data processing, Weather forecasting, Statistical analysis, United States—Michigan

## 53-1963

Determining the snow water equivalent of shallow prairie snowcovers.

Shook, K., Gray, D.M., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.89-95, 8 refs.

Plains, Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Snow hydrology, Snowmelt, Runoff forecasting, Statistical analysis, Canada—Saskatchewan

## 53-1964

**Case study of Great Lakes aggregate effects on lake-effect snow in Michigan.**

Sousounis, P.J., Mann, G.E., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.97-104, 12 refs. Atmospheric circulation, Atmospheric disturbances, Lake effects, Snowstorms, Snowfall, Weather forecasting, Computerized simulation, Great Lakes, United States—Michigan

## 53-1965

**Effect of cover type on snow isotopic composition.**

Brammer, D.D., Brown, V.A., Houck, R.E., Kendall, C., McDonnell, J.J., Titus, A.C., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.105-114, 27 refs. Vegetation patterns, Vegetation factors, Snow composition, Metamorphism (snow), Snow stratigraphy, Snow hydrology, Snowmelt, Runoff, Isotope analysis, United States—New York

## 53-1966

**Organic chemical permeation and storage in seasonal snow.**

Hogan, A.W., Leggett, D.C., MP 5276, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.115-120, 8 refs.

Explosives, Waste disposal, Soil pollution, Vapor transfer, Snow cover effect, Snow permeability, Snow composition, Snow impurities

Experiments were conducted near the laboratory, where shallow trays or inverted containers containing nitroaromatic compounds as vapor sources were placed in contact with the surface prior to snowfall. Snow was allowed to accumulate over the sources, and the temperature profile within the adjacent snow and soil was recorded. After several days snow blocks were collected at 5 cm intervals above the trays. Snow densities, particle sizes, and grain character were determined on site. Nitroaromatic compounds in the meltwater were determined in the laboratory by liquid chromatography. Their concentrations were examined with respect to temperature gradient, snow density, and grain size distribution and found to vary systematically with distance from the source. None of the specimens analyzed contained the equivalent of a monolayer of compound based on the estimated specific surface of the snow. The front of instrumental detection of nitroaromatics was a function of the vapor pressure of the particular source compound; DNT permeated about 1 cm/day in "dry" snow.

## 53-1967

**Surface hoarfrost measurement and climatology.**

Ryerson, C.C., Claffey, K.J., Lemieux, G.E., MP 5277, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.121-130, 8 refs.

Hoarfrost, Glaze, Ice accretion, Ice detection, Ice forecasting, Frost forecasting, Warning systems

Surface hoarfrost modifies snowpacks and reduces travel safety, and it is neither measured nor forecast by weather services. The objectives of the authors are to show the reliability of hoarfrost measurements made with an ice detector and to simulate hoarfrost events. During evaluation of a Rosemount glaze ice detector, they found that it reliably indicated hoarfrost accretion. The ice detector probe's frequency was compared to the accreted frost weight on vertically and horizontally oriented metal test plates on 22 mornings. Ice detector probe frequency drop and plate frost weight correlated with  $R^2 > 0.6$ . The ice detector probe's vertical axis indicated the onset of frost accretion on vertical surfaces well, but horizontal surfaces typically began to frost a few hours earlier. Weather conditions at the onset and cessation of frost events were used to develop a rule-based forecast technique that successfully predicted most frost events observed by the ice detector.

## 53-1968

**Temporal and spatial variability of winter thermal background scenes.**

Peck, L., MP 5278, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.131-141, 11 refs.

Snow optics, Snow surface temperature, Snow cover effect, Grasses, Vegetation factors, Soil temperature, Surface temperature, Infrared reconnaissance, Warning systems

This paper contrasts three winter backgrounds at a northern New England site in terms of surface temperature range, rate of temperature change, and spatial homogeneity. Ground cover surface temperatures usually are expressed as averages over several hours or days, which makes seasonal differences in thermal radiance apparent but obscures shorter-term variations that affect energy exchanges and infrared sensor systems. For this study, surface temperatures of the three winter ground covers are determined at half-hour intervals. The early winter background is a uniform grass cover following the end of the growing season. By late winter this has become a heterogeneous ground cover of thatch, new-growth grass, and exposed soil, which is a dynamic thermal background with strong daytime/nighttime differences. The midwinter snow cover is a stable thermal background because of its typically low rates of temperature change and low thermal radiance. It is shown that these three backgrounds produce distinctly different responses by passive infrared thermal

devices (PIRs) that are sensitive to the spatial variability of changes (both magnitude and rate of change) in thermal radiance from the area being viewed. It is proposed that a PIR could be used to determine remotely the nature of the ground cover (grass, snow, grass-thatch-soil) and particularly to detect early and late winter transient snow covers.

## 53-1969

**Measurement and data analysis of weather and avalanche records: recent directions and perspectives with case studies.**

Davis, R.E., Elder, K., MP 5279, *Eastern Snow Conference. Proceedings*, 1994, 51st, p.143-150, 24 refs.

Snow surveys, Snowfall, Snow depth, Snow water equivalent, Meteorological factors, Avalanche forecasting, Data processing, Computerized simulation, Statistical analysis

Records of avalanche occurrence and control efforts have traditionally been correlated to snow and weather observations from local study plots. Recent attempts to rank or score the sensitivity of various study plot and meteorological observations to avalanche activity are reviewed with discussion on the utility of different methods of analysis. The discussion is expanded by showing examples using decision-tree methodology on data from a site under a maritime climate regime. It is shown that characterization of avalanche activity does not seem to affect the ranking of important variables, but it is important to overall classification accuracy. The rank order of the five primary variables was: new snow (24 hr) depth, snow water equivalent of the storm snow, storm total snow depth, average wind speed and total snow depth. The probability of correct classification was much higher for the maximum size class, compared with the total number of avalanche releases.

## 53-1970

**Reduction of winter driving hazards: a review of research and development in Ontario.**

Perchanok, M.S., *Eastern Snow Conference. Proceedings*, 1994, 51st, p.151-156, 19 refs.

Road icing, Ice detection, Snowdrifts, Blowing snow, Snow fences, Snow hedges, Salting, Sanding, Chemical ice prevention, Snow removal, Highway planning, Road maintenance, Cost analysis, Canada—Ontario

## 53-1971

**Papers.**

International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997, McClung, D.M., ed, *Annals of glaciology*, 1998, Vol.26, 394p., Refs. passim. For individual papers see 53-1972 through 53-2041.

Snow cover structure, Snow stratigraphy, Snow density, Snow strength, Snow cover stability, Snow air interface, Blowing snow, Snowdrifts, Snow erosion, Wind erosion, Avalanche mechanics, Avalanche modeling, Avalanche forecasting

## 53-1972

**Mechanical and structural properties of weak snow layers measured in situ.**

Föhn, P.M.B., Camponovo, C., Krüsi, G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.1-6, 23 refs.

Snow cover structure, Snow stratigraphy, Depth hoar, Snow strength, Snow cover stability, Snow slides, Avalanche forecasting

## 53-1973

**Field observation and modelling of weak-layer evolution.**

Fierz, C., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.7-13, 12 refs.

Snow cover structure, Snow stratigraphy, Metamorphism (snow), Snow strength, Snow cover stability, Avalanche forecasting

## 53-1974

**Dependence of new-snow density on slope angle.**

Endo, Y., Kominami, Y., Niwano, S., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.14-18, 6 refs.

Snow depth, Snow accumulation, Snow density, Slope processes, Snow compression, Snow cover stability, Avalanche forecasting

## 53-1975

**Snow-creep forces on masts.**

Larsen, J.O., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.19-21, 5 refs.

Power line supports, Towers, Power line icing, Snow creep, Snow slides, Snow loads

## 53-1976

**Daytime preservation of surface-hoar crystals.**

Hachikubo, A., Akitaya, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.22-26, 9 refs.

Snow surface, Snow air interface, Snow crystal growth, Hoarfrost, Snow stratigraphy, Depth hoar, Snow strength, Snow cover stability, Snow slides, Avalanche forecasting

## 53-1977

**Measurement of snow-hardness distribution.**

Takeuchi, Y., Nohguchi, Y., Kawashima, K., Izumi, K., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.27-30, 5 refs.

Snow cover structure, Snow stratigraphy, Snow hardness, Snow density, Snow strength, Snow survey tools, Snow samplers

## 53-1978

**Tentative investigations on surface hoar in mountain forests.**

Höller, P., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.31-34, 12 refs.

Forest land, Forest lines, Snow air interface, Snow heat flux, Snow surface, Snow cover structure, Snow stratigraphy, Hoarfrost, Depth hoar, Snow cover stability, Snow slides, Avalanche formation, Avalanche forecasting, Austria

## 53-1979

**Energy balance and formation of sun crust in snow.**

Ozeki, T., Akitaya, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.35-38, 8 refs.

Snow surface, Snow air interface, Snow heat flux, Snow crust

## 53-1980

**Modelling of the densification of polar firn: characterization of the snow-firn transition.**

Arnaud, L., Lipenkov, V.I.A., Barnola, J.M., Gay, M., Duval, P., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.39-44, 30 refs.

Ice sheets, Snow compression, Firn stratification, Snow ice interface, Ice sintering, Glacier ice, Ice density

## 53-1981

**Modelling the change in structure and mechanical properties in dry-snow densification to ice.**

Golubev, V.N., Frolov, A.D., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.45-50, 10 refs.

Snow cover structure, Snow strength, Snow elasticity, Snow compression, Snow density, Snow ice interface, Ice formation, Mathematical models

- 53-1982**  
**Preliminary numerical investigation of the micro-mechanics of snow compaction.**  
 Johnson, J.B., MP 5280, *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.51-54, 15 refs.  
 Snow cover structure, Microstructure, Snow density, Snow strength, Snow elasticity, Snow plasticity, Snow deformation, Snow creep, Snow compaction, Snow compression, Computerized simulation  
 A dynamic finite-element computer program was used to examine the evolution of microstructure and its effect on continuum-scale deformation for the constant-speed uniaxial-strain compaction of an aggregate of roughly spherical elastic-plastic particles. Simulation results are used to explain some micromechanical aspects of snow compaction. Different compaction rates were used to examine the limits of quasi-static response and the effects of inertial stresses. Four stages of microstructurally controlled compaction were observed for quasi-static loading: particle re-arrangement, elastic deformation and two stages of plastic deformation. Observed pressure-density profiles for polar snow exhibit the same features of critical density and changes in the pressure-density ratio as found in the simulation and consist of four compaction stages: particle re-arrangement and three stages of creep particle deformation each following a critical density. Shear stresses appear to enhance the compaction during the stage III creep deformation of snow.
- 53-1983**  
**Elastic properties of snow-ice formations in their whole density range.**  
 Frolov, A.D., Fediukin, I.V., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.55-58, 16 refs.  
 Snow cover structure, Snow acoustics, Snow elasticity, Snow strength, Snow compression, Snow ice interface, Ice formation
- 53-1984**  
**Hemispherical-directional reflectance measurements of natural snow in the 0.9-1.45  $\mu$ m spectral range: comparison with adding-doubling modeling.**  
 Sergeant, C., Leroux, C., Pougatch, E., Guirado, F., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.59-63, 20 refs.  
 Snow cover structure, Metamorphism (snow), Snow morphology, Snow optics, Reflectivity, Ice crystal size, Ice crystal optics
- 53-1985**  
**Irreducible water saturation in snow: experimental results in a cold laboratory.**  
 Coléou, C., Lesaffre, B., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.64-68, 11 refs.  
 Wet snow, Snow water content, Snow permeability, Snow density, Snow cover structure, Snow morphology
- 53-1986**  
**Measurement of density and wetness in snow using time-domain reflectometry.**  
 Schneebeli, M., Coléou, C., Touvier, F., Lesaffre, B., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.69-72, 14 refs.  
 Snow density, Snow water content, Snow electrical properties, Ice dielectrics, Snow survey tools, Snow samplers, Moisture meters
- 53-1987**  
**Wavy temperature and density distributions formed in snow.**  
 Sokratov, S.A., Maeno, N., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.73-76, 12 refs.  
 Snow density, Snow thermal properties, Snow temperature, Snow heat flux, Snow permeability, Water vapor, Vapor diffusion
- 53-1988**  
**Viscous compression model for estimating the depth of new snow.**  
 Kominami, Y., Endo, Y., Niwano, S., Ushioda, S., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.77-82, 13 refs.  
 Snow depth, Snow accumulation, Snow compression, Snow density, Snow stratigraphy, Mathematical models, Statistical analysis
- 53-1989**  
**Formation of ice layers by infiltration and refreezing of meltwater.**  
 Pfeffer, W.T., Humphrey, N.F., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.83-91, 27 refs.  
 Ice sheets, Ice cores, Glacier alimentation, Glacial hydrology, Snow stratigraphy, Snow ice interface, Snow ice, Snowmelt, Meltwater, Seepage, Regelation, Glacier ice, Firn stratification, Mathematical models, Greenland
- 53-1990**  
**Acoustic impedance measurement of snow density.**  
 Marco, O., Buser, O., Villemain, P., Touvier, F., Revol, P., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.92-96, 22 refs.  
 Snow cover structure, Snow density, Snow acoustics, Acoustic measurement, Mathematical models
- 53-1991**  
**Laboratory experiments on shear failure of snow.**  
 Schweizer, J., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.97-102, 29 refs.  
 Snow strength, Snow deformation, Snow cover stability, Snow slides, Avalanche formation, Avalanche forecasting
- 53-1992**  
**Portable calorimeter for measuring liquid-water content of wet snow.**  
 Kawashima, K., Endo, T., Takeuchi, Y., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.103-106, 17 refs.  
 Wet snow, Snow water content, Moisture meters, Calorimeters, Snow survey tools, Snow samplers
- 53-1993**  
**Constant-speed penetrometer for high-resolution snow stratigraphy.**  
 Schneebeli, M., Johnson, J.B., MP 5281, *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.107-111, 16 refs.  
 Snow cover structure, Snow stratigraphy, Snow strength, Snow hardness, Snow cover stability, Avalanche forecasting, Penetration tests, Penetrometers, Snow survey tools, Snow samplers  
 A new constant-speed penetrometer for field and laboratory measurements has been developed. The initially independent work of SFISAR and CRREL has been brought together, and a portable field device is now in an advanced stage of testing. The new penetrometer has high rigidity and a high-resolution large dynamic range force sensor. It uses a much smaller sensing head (5 mm) than previous designs and has a constant-speed drive. With this construction, the penetration resistance of very fine layers and the influence of the bonding strength between snow grains can be more accurately determined than is possible with the ramsonde or Pandalp. Artificial foam layers as thin as 2 mm and thin layers in snow have been detected by the penetrometer. Thin snow layers detected from penetration-resistance profiles have been correlated to fine layering as determined from plane-section microphotographs of samples taken adjacent to the profile. The instrument's measurements are highly repeatable and the lack of subjective decisions when operating the penetrometer makes the penetration resistance a quantitative measure of snow stratigraphy.
- 53-1994**  
**Objective determination of snow-grain characteristics from images.**  
 Lesaffre, B., Pougatch, E., Martin, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.112-118, 6 refs.  
 Snow cover structure, Snow morphology, Metamorphism (snow), Snow crystal structure, Ice crystal size, Ice crystal replicas, Computer applications, Image processing
- 53-1995**  
**Snowpack water-equivalent estimates from satellite and aircraft remote-sensing measurements of the Red River basin, north-central U.S.A.**  
 Josberger, E.G., Mognard, N.M., Lind, B., Matthews, R., Carroll, T., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.119-124, 25 refs.  
 Snow surveys, Snow cover distribution, Snow water equivalent, Terrain identification, Radiometry, Aerial surveys, Spaceborne photography, Image processing, United States—North Dakota, United States—South Dakota, United States—Minnesota
- 53-1996**  
**Differences in compaction behavior of three climate classes of snow.**  
 Sturm, M., Holmgren, J., MP 5282, *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.125-130, 22 refs.  
 Snow surveys, Snow cover distribution, Snow morphology, Snow compaction, Snow compression, Snow density, Snow water equivalent, Climatic factors, Meteorological data, Data processing, Statistical analysis  
 In a recent paper (Sturm et al., 1995), a global seasonal snow-cover classification system was developed with each class defined by snow properties like grain-size and type. Here, characteristic bulk density vs time curves are assigned to three classes using snow-course data from Alaskan and Canadian sites. Within each class, curves have similar slopes and intercepts but between classes they are different. The relationship between slope, intercept and snow rheology has been investigated using a finite-difference model in which snow layers are assumed to behave as viscous fluids. Using observed slopes, the density-dependent compactive viscosity of each class has been determined. These are consistent with published values. Results indicate that load and load history are less important to the compaction behavior than grain and bond characteristics, snow temperature and wetness. The study suggests that differences in compaction behavior arise primarily from differences in rheology, the result of climatically controlled differences in the character of the snow. This finding explains why regional snow densities have been successfully predicted from air temperature and wind speed alone, without considering snow depth.
- 53-1997**  
**New categories for the climatic division of snowy areas in Japan.**  
 Ishizaka, M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.131-137, 7 refs.  
 Snow surveys, Snow cover distribution, Snow morphology, Snow depth, Wet snow, Depth hoar, Air temperature, Climatic factors, Meteorological data, Statistical analysis, Japan
- 53-1998**  
**Validation of an application for forecasting blowing snow.**  
 Guyomarc'h, G., Mérindol, L., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.138-143, 14 refs.  
 Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Weather forecasting, Avalanche triggering, Avalanche forecasting, Statistical analysis, Computerized simulation, France

## 53-1999

**Relationship between snowdrift development and drifted snow during a wind episode.**

Mases, M., Font, D., Vilaplana, J.M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.144-148, 10 refs.

Blowing snow, Snowdrifts, Snow depth, Wind erosion, Snow erosion, Weather forecasting, Spain—Pyrenees

## 53-2000

**Determination of snow-covered area in different land covers in central Alaska, U.S.A., from aircraft data—April 1995.**

Hall, D.K., Foster, J.L., Chang, A.T.C., Benson, C.S., Chien, J.Y.L., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.149-155, 16 refs.

Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Forest land, Forest canopy, Radiometry, Terrain identification, Aerial surveys, Image processing, Mapping, United States—Alaska

## 53-2001

**Solute in high arctic glacier snow cover and its impact on runoff chemistry.**

Hodgkins, R., Tranter, M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.156-160, 23 refs.

Glacial hydrology, Snow hydrology, Snow composition, Snowmelt, Meltwater, Air pollution, Scavenging, Water pollution, Runoff, Hydrogeochemistry, Water chemistry, Norway—Spitsbergen

## 53-2002

**Snowmelt modelling on Signy Island, South Orkney Islands.**

Gardiner, M.J., Ellis-Evans, J.C., Anderson, M.G., Tranter, M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.161-166, 31 refs.

Snow air interface, Albedo, Snow heat flux, Snow hydrology, Snow water equivalent, Snow melting, Snowmelt, Runoff forecasting, Computerized simulation, Antarctica—Signy Island

## 53-2003

**Interaction between drifting snow and atmospheric turbulence.**

Bintanja, R., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.167-173, 28 refs.

Snow air interface, Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Wind velocity, Atmospheric boundary layer, Turbulence, Turbulent exchange, Mathematical models

## 53-2004

**Blowing and drifting snow in alpine terrain: numerical simulation and related field measurements.**

Gauer, P., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.174-178, 16 refs.

Snow air interface, Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Avalanche forecasting, Mathematical models

## 53-2005

**Turbulent fluxes above the snow surface.**

Martin, E., Lejeune, Y., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.179-183, 13 refs.

Snow air interface, Snow heat flux, Atmospheric boundary layer, Turbulent exchange, Computerized simulation

## 53-2006

**Measurements and numerical simulations of snow-particle saltation.**

Nishimura, K., Sugiura, K., Nemoto, M., Maeno, N., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.184-190, 21 refs.

Snow air interface, Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Wind tunnels, Environment simulation, Mathematical models

## 53-2007

**Numerical simulation of drifting snow: erosion and deposition models.**

Naaim, M., Naaim-Bouvet, F., Martinez, H., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.191-196, 13 refs.

Snow air interface, Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Turbulent exchange, Mathematical models, Computerized simulation

## 53-2008

**Development of a rule-based spatial model of wind transport and deposition of snow.**

Purves, R.S., Barton, J.S., Mackaness, W.A., Sugden, D.E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.197-202, 11 refs.

Snow air interface, Blowing snow, Snowdrifts, Snow accumulation, Wind erosion, Snow erosion, Topographic effects, Computerized simulation

## 53-2009

**Simulation of blowing snow over the Antarctic ice sheet.**

Galleé, H., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.203-206, 24 refs.

Blowing snow, Snow air interface, Snow evaporation, Polar atmospheres, Atmospheric circulation, Atmospheric pressure, Atmospheric density, Wind (meteorology), Computerized simulation, Antarctica

## 53-2010

**Charge-to-mass ratio of individual blowing-snow particles.**

Schmidt, D.S., Dent, J.D., Schmidt, R.A., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.207-211, 13 refs.

Snow air interface, Blowing snow, Wind erosion, Snow erosion, Snow electrical properties, Cloud electrification, Charge transfer

## 53-2011

**Snowdrift modelling in a wind tunnel: vertical and horizontal variation of the snow flux.**

Naaim-Bouvet, F., Naaim, M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.212-216, 16 refs.

Snowstorms, Snow air interface, Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Wind tunnels, Environment simulation

## 53-2012

**Field experiments on "living" snow fences.**

Naaim-Bouvet, F., Mullenbach, P., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.217-220, 8 refs.

Blowing snow, Snowdrifts, Snow fences, Snow hedges, Protective vegetation, France

## 53-2013

**Drifting-snow acoustic detector: experimental tests in La Molina, Spanish Pyrenees.**

Font, D., Naaim-Bouvet, F., Roussel, M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.221-224, 9 refs.

Blowing snow, Snowdrifts, Snow acoustics, Acoustic measurement, Anemometers, Precipitation gages, Spain—Pyrenees

## 53-2014

**Experimental mass-flux measurements: a comparison of different gauges with estimated theoretical data.**

Font, D., Mases, M., Vilaplana, J.M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.225-230, 10 refs.

Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Precipitation gages, Anemometers, Spain—Pyrenees

## 53-2015

**Passive snow removal with a vortex generator at the Pegasus runway, Antarctica.**

Lang, R.M., Blaisdell, G.L., MP 5283, *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.231-236, 10 refs.

Ice shelves, Ice runways, Snow ice interface, Snow removal, Snow removal equipment, Snow fences, Wind erosion, Snow erosion, Antarctica—McMurdo Ice Shelf

During the construction phase of the Pegasus runway on the McMurdo Ice Shelf, relatively large amounts of snow and ice were cleared to meet basic grade requirements for the runway surface. A considerable amount of material remains adjacent to the runway in two north-south extending mounds (berms). The runway was originally constructed on an experimental basis so attention was not focused on developing and executing a snow-removal/accumulation plan. After the runway was successfully constructed and supporting routine flight operations, concern developed over the possibility of snow accumulation adjacent to the berm area eventually inundating the runway. The intent of this project was to analyze snow accumulation and to recommend passive methods for removing some of the berm material and snow adjacent to the berm. The authors found that large quantities of excess snow could be removed by use of vortex fences which cause erosion on the leeward side of the fence. The vortex fence was designed to be portable (unlike traditional jet or blower fences) and self-orienting into the wind to allow snow removal regardless of the wind direction. The vortices generated by the fence do not dissipate rapidly, providing effective and sustained erosion.

## 53-2016

**Empirical model for snowdrift distribution in avalanche-starting zones.**

Mases, M., Buisson, L., Frey, W., Marti, G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.237-241, 8 refs.

Blowing snow, Snowdrifts, Wind erosion, Snow erosion, Avalanche formation, Avalanche modeling, Avalanche forecasting, Switzerland

## 53-2017

**Physical modelling of avalanches using an aerosol cloud of powder materials.**

Bozhinski, A.N., Sukhanov, L.A., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.242-246, 11 refs.

Avalanche mechanics, Avalanche tracks, Avalanche deposits, Avalanche modeling, Environment simulation

## 53-2018

**Density, velocity and friction measurements in a dry-snow avalanche.**

Dent, J.D., Burrell, K.J., Schmidt, D.S., Louge, M.Y., Adams, E.E., Jazbutis, T.G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.247-252, 8 refs.

Snow density, Avalanche mechanics, Avalanche tracks, Avalanche modeling, Shear flow, Snow loads

## 53-2019

**Modelling of snow entrainment and deposition in powder-snow avalanches.**

Issler, D., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.253-258, 21 refs.

Snow density, Snow erosion, Avalanche formation, Avalanche tracks, Avalanche deposits, Avalanche mechanics, Avalanche modeling, Mathematical models

## 53-2020

**Measurements of the velocity distribution in ping-pong-ball avalanches.**

Keller, S., Ito, Y., Nishimura, K., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.259-264, 14 refs.

Avalanche mechanics, Avalanche modeling

## 53-2021

**Simulations of dense-snow avalanches on deflecting dams.**

Irgens, F., Schieldrop, B., Harbitz, C.B., Domaas, U., Opsahl, R., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.265-271, 14 refs.

Avalanche mechanics, Avalanche modeling, Avalanche engineering, Snow loads, Snow fences, Mathematical models

## 53-2022

**Limiting stress states in granular avalanches.**

Tai, Y.C., Gray, J.M.N.T., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.272-276, 7 refs.

Avalanche mechanics, Avalanche modeling, Shear flow, Mathematical models

## 53-2023

**On the inclusion of a velocity-dependent basal drag in avalanche models.**

Gray, J.M.N.T., Tai, Y.C., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.277-280, 6 refs.

Avalanche mechanics, Avalanche modeling, Shear flow, Mathematical models

## 53-2024

**Mathematical and physical modelling of powder-snow avalanches in Russia.**

Eglit, M.E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.281-284, 31 refs.

Avalanche mechanics, Avalanche modeling, Turbulent flow, Mathematical models

## 53-2025

**Statistical prediction of maximum avalanche run-out distances from topographic data in the western Catalan Pyrenees (northeast Spain).**

Furdada, G., Vilaplana, J.M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.285-288, 9 refs.

Avalanche tracks, Avalanche deposits, Avalanche mechanics, Avalanche modeling, Avalanche forecasting, Statistical analysis, Spain—Pyrenees

## 53-2026

**Physical and numerical analysis of the front of a gravity current on a horizontal bottom.**

Naaim, M., Pellarin, T., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.289-295, 15 refs.

Avalanche mechanics, Avalanche modeling, Turbulent flow, Mathematical models

## 53-2027

**Refinements to the stability index for skier-triggered dry-slab avalanches.**

Jamieson, J.B., Johnston, C.D., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.296-302, 24 refs.

Snow cover structure, Snow strength, Snow cover stability, Avalanche triggering, Avalanche forecasting, Mathematical models, Statistical analysis

## 53-2028

**Probabilistic evaluation of snow-slab stability on mountain slopes.**

Chernous, P.A., Fedorenko, I.U.V., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.303-306, 8 refs.

Snow strength, Snow cover stability, Avalanche triggering, Avalanche forecasting, Statistical analysis

## 53-2029

**Impact of surface perturbations on snow-slope stability.**

Conway, H., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.307-312, 16 refs.

Snow strength, Snow cover stability, Snow slides, Avalanche triggering, Avalanche forecasting, Mathematical models

## 53-2030

**Prototype for operational seismic detection of natural avalanches.**

Lepretre, B., Navarre, J.P., Panel, J.M., Touvier, F., Taillefer, A., Rouille, J., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.313-318, 6 refs.

Snow cover stability, Snow acoustics, Snowquakes, Avalanche forecasting, Seismic surveys, Warning systems, Data transmission, France

## 53-2031

**Study of avalanche dynamics by seismic methods, image-processing techniques and numerical models.**

Sabot, F., Naaim, M., Granada, F., Suriñach, E., Planet, P., Furdada, G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.319-323, 8 refs.

Snow acoustics, Snowquakes, Avalanche modeling, Avalanche tracks, Seismic surveys, Image processing, Spain—Pyrenees

## 53-2032

**Infrasonic monitoring of snow-avalanche activity: what do we know and where do we go from here.**

Adam, V., Chritin, V., Rossi, M., Van Lancker, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.324-328, 5 refs.

Snow cover stability, Snow acoustics, Snowquakes, Avalanche forecasting, Acoustic measurement, Warning systems, Switzerland

## 53-2033

**Spatial characteristics of avalanche activity in an Alpine valley—a GIS approach.**

Stoffel, A., Meister, R., Schweizer, J., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.329-336, 10 refs.

Avalanches, Avalanche formation, Avalanche triggering, Avalanche tracks, Accidents, Avalanche forecasting, Data processing, Statistical analysis, Switzerland

## 53-2034

**Global distribution of snow avalanches and changing activity in the Northern Hemisphere due to climate change.**

Glazovskaia, T.G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.337-342, 3 refs.

Snow cover distribution, Global warming, Avalanches, Avalanche forecasting, Long range forecasting, Computerized simulation

## 53-2035

**Field method for avalanche danger-level verification.**

Cagnati, A., Valt, M., Soratroi, G., Gavalda, J., Sellés, C.G., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.343-346, 8 refs.

Snow cover stability, Avalanche forecasting, Data processing, Italy, Spain

## 53-2036

**Crocus test results for snowpack modeling in two snow climates with respect to avalanche forecasting.**

Mingo, L., McClung, D.M., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.347-356, 19 refs.

Snow depth, Snow density, Snow temperature, Metamorphism (snow), Snow cover structure, Snow stratigraphy, Hoarfrost, Depth hoar, Snow cover stability, Avalanche forecasting, Computerized simulation, Canada—British Columbia—Glacier National Park, Canada—British Columbia—Coast Mountains

## 53-2037

**Short-term numerical avalanche forecast used operationally at Météo-France over the Alps and Pyrenees.**

Durand, Y., Giraud, G., Mérindol, L., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.357-366, 14 refs.

Precipitation (meteorology), Meteorological data, Data processing, Weather forecasting, Snow cover stability, Avalanche forecasting, Computerized simulation, France—Alps, France—Pyrenees

## 53-2038

**Inferential statistics to verify prediction models.**

Bolognesi, R., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.367-369, 4 refs.

Avalanche forecasting, Data processing, Computerized simulation, Statistical analysis

## 53-2039

Slushflow hazard—where, why and when? 25 years of experience with slushflow consulting and research.

Hestnes, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.370-376, 16 refs.

Snow cover stability, Slush, Avalanche formation, Avalanche triggering, Avalanche forecasting, Flood forecasting, Norway

## 53-2040

Atmospheric and hydrological boundary conditions for slushflow initiation due to snowmelt.

Scherer, D., Gude, M., Gempeler, M., Parlow, E., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.377-380, 14 refs.

Snow hydrology, Snowmelt, Slush, Snow cover stability, Avalanche formation, Avalanche triggering, Avalanche forecasting, Flood forecasting, Norway—Spitsbergen, Sweden

## 53-2041

Snowmelt and slushflows: hydrological and hazard implications.

Gude, M., Scherer, D., *Annals of glaciology*, 1998, Vol.26, International Symposium on Snow and Avalanches, Chamonix Mont-Blanc, France, May 26-30, 1997. Papers. Edited by D.M. McClung, et al, p.381-384, 17 refs.

Snow hydrology, Snowmelt, Slush, Snow cover stability, Avalanche formation, Avalanche triggering, Avalanche forecasting, Flood forecasting, Norway—Spitsbergen, Sweden

## 53-2042

Neodymium and strontium isotopic and trace element composition of a Mesozoic CFB suite from Dronning Maud Land, Antarctica: implications for lithosphere and asthenosphere contributions to Karoo magmatism.

Luttinen, A.V., Rämö, O.T., Huhma, H., *Geochimica et cosmochimica acta*, Aug. 1998, 62(15), p.2701-2714, Refs. p.2712-2714.

Geologic structures, Geochemistry, Magma, Isotopes, South Africa, Antarctica—Queen Maud Land

## 53-2043

Geology, geochemistry and geophysics of the Kerguelen Islands. [Géologie, géochimie et géophysique des Kerguelen]

Schlich, R., Giret, A., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, 108p., In French or English. Refs. passim. For individual papers see 53-2043 through 53-2052.

DLC QE1.S7 n.s. No.166

Marine geology, Bottom sediment, Volcanoes, Magma, Geochemistry, Hydrothermal processes, Earth crust, Continental drift, Tectonics, Stratigraphy, Geochronology, Kerguelen Islands

## 53-2044

Distribution of felsic rocks within the alkaline igneous centres.

Bonin, B., Bardintzeff, J.M., Giret, A., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.9-24, With French summary. Refs. p.21-24.

DLC QE1.S7 n.s. No.166

Geological surveys, Geophysical surveys, Rock properties, Lithology, Volcanoes, Magma, Hydrothermal processes, Geochemistry, Tectonics, Earth crust, Geochronology, Kerguelen Islands

## 53-2045

Chemical and carbon isotopic compositions of the fumaroles of the Rallier du Baty peninsula (Kerguelen Islands). [Étude chimique et rapport isotopique du carbone des fumarolles de la péninsule Rallier du Baty (îles Kerguelen)]

Delorme, H., Verdier, O., Cheminée, J.L., Giret, A., Pineau, F., Javoy, M., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.25-30, In French with English summary. 24 refs.

DLC QE1.S7 n.s. No.166

Volcanoes, Magma, Hydrothermal processes, Geochemistry, Geochemistry, Chemical analysis, Isotope analysis, Kerguelen Islands

## 53-2046

Zeolites of Kerguelen Islands: nature and diversity. [Nature et diversité des zéolites de Kerguelen]

Nativel, P., Verdier, O., Giret, A., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.31-45, In French with English summary. 58 refs.

DLC QE1.S7 n.s. No.166

Minerals, Volcanoes, Magma, Geochemistry, Hydrogeochemistry, Geothermy, Hydrothermal processes, Kerguelen Islands

## 53-2047

Kerguelen plutonic complexes: Sr, Nd, Pb isotopic study and inferences about their sources, age, and geodynamic setting.

Weis, D., Giret, A., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.47-59, With French summary. 51 refs.

DLC QE1.S7 n.s. No.166

Geochemistry, Isotope analysis, Lithology, Volcanoes, Magma, Earth crust, Geochronology, Tectonics, Kerguelen Islands

## 53-2048

Magmatic activity associated with the Kerguelen-Heard plume: implications for plume dynamics.

Saunders, A.D., Storey, M., Kent, R.W., Gibson, I.L., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.61-72, With French summary. 69 refs.

DLC QE1.S7 n.s. No.166

Earth crust, Continental drift, Tectonics, Volcanoes, Magma, Geochemistry, Geochronology, Kerguelen Islands

## 53-2049

Campanian-Maastrichtian foraminifera and nannoplankton from the Kerguelen-Heard Plateau. [Foraminifères et nannoplankton du Campanien-Maastrichtien inférieur sur le plateau de Kerguelen-Heard (océan Indien)]

Robaszynski, F., Acheriteguy, J., Fröhlich, F., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.73-80, In French with English summary. 12 refs.

DLC QE1.S7 n.s. No.166

Marine geology, Marine deposits, Bottom sediment, Fossils, Drill core analysis, Stratigraphy, Soil dating, Geochronology, Kerguelen Islands

## 53-2050

Geologic evolution of the Kerguelen-Heard Plateau (Indian Ocean). [Évolution géologique du plateau de Kerguelen-Heard (océan Indien)]

Fröhlich, F., Gely, J.P., Perseil, E.A., Wicquart, E., Verdier, O., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.81-90, In French with English summary. 36 refs.

DLC QE1.S7 n.s. No.166

Geological surveys, Geophysical surveys, Marine geology, Bottom sediment, Magma, Geochemistry, Hydrothermal processes, Earth crust, Continental drift, Tectonics, Stratigraphy, Geochronology, Kerguelen Islands

## 53-2051

77°E graben and the history of the southern Kerguelen Plateau.

Leclaire, L., Bassias, Y., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.91-97, With French summary. 33 refs.

DLC QE1.S7 n.s. No.166

Geological surveys, Geophysical surveys, Marine geology, Bottom topography, Bottom sediment, Tectonics, Magma, Earth crust, Continental drift, Stratigraphy, Geochronology, Kerguelen Islands

## 53-2052

Extensive tectonics on the Kerguelen Plateau.

[Tectonique extensive sur le plateau de Kerguelen]

Munsch, M., Fritsch, B., Schlich, R., Rotstein, Y., *Société Géologique de France. Mémoires. Nouvelle série*, 1994, No.166, Géologie, géochimie et géophysique des Kerguelen. Edited by R. Schlich and A. Giret, p.99-108, In French with English summary. 42 refs.

DLC QE1.S7 n.s. No.166

Marine geology, Bottom topography, Bottom sediment, Magma, Earth crust, Continental drift, Tectonics, Drill core analysis, Stratigraphy, Geochronology, Kerguelen Islands

## 53-2053

Testing the frost resistance of chippings. [Prüfung der Frostbeständigkeit von Körnungen]

Eppenstein, W., Krzemien, R., *Austria. Bundesministerium für Wirtschaftliche Angelegenheiten. Straßenforschung (Federal Ministry for Economic Affairs. Road research)*, 1990, No.389, p.1-62, In German with French and English summaries. 25 refs.

Pavements, Bitumens, Frost resistance, Freeze thaw tests, Road maintenance, Austria

## 53-2054

Low temperature behavior of polymer-modified bitumen layers. [Zum Kälteverhalten polymer-modifizierter Asphaltsschichten]

Baumann, H., Fenz, G., Krzemien, R., Rainer, A., Waldhans, H., *Austria. Bundesministerium für Wirtschaftliche Angelegenheiten. Straßenforschung (Federal Ministry for Economic Affairs. Road research)*, 1990, No.389, p.63-87, In German with French and English summaries. 27 refs.

Pavements, Bitumens, Polymers, Low temperature tests, Road maintenance, Austria

## 53-2055

Avalanche radar for road protection. Final report. [Lawinenradar für die Straßensicherung Endbericht]

Riedler, W., Randeu, W., Okorn, R., *Austria. Bundesministerium für wirtschaftliche Angelegenheiten. Straßenforschung (Federal Ministry for Economic Affairs. Road research)*, 1991, No.396, 31p., In German with French and English summaries. 5 refs.

Avalanche triggering, Avalanche tracks, Explosives, Blasting, Radar tracking, Safety, Road maintenance, Austria

## 53-2056

Ice warning systems test 1990/91. [Glatteisfrühwarnsysteme Test 1990/91]

Scharsching, H., *Austria. Bundesministerium für Wirtschaftliche Angelegenheiten. Straßenforschung (Federal Ministry for Economic Affairs. Road research)*, 1992, No.412, 233p., In German with French and English summaries. 19 Refs.

Road icing, Glaze, Ice detection, Ice forecasting, Warning systems, Cold weather tests, Road maintenance, Austria



53-2057

**Non-frost susceptible unbound road bases.** [Frost-sichere, ungebundene Tragschichten aus sandarmen Korngemischen]

Krzemien, R., Langer, W., Austria. *Bundesministerium für Wirtschaftliche Angelegenheiten. Straßenforschung (Federal Ministry for Economic Affairs. Road research)*, 1995, No.430, p.59-111, In German with French and English summaries. 47 refs.

Subgrades, Aggregates, Frost resistance, Frost protection, Subgrade maintenance, Road maintenance, Austria

53-2058

**Retrieval of tropical cirrus thermal optical depth, crystal size, and shape using a dual-view instrument at 3.7 and 10.8  $\mu\text{m}$ .**

Baran, A.J., Brown, S.J., Foot, J.S., Mitchell, D.L., *Journal of the atmospheric sciences*, Jan. 1, 1999, 56(1), p.92-110, 54 refs.

Climatology, Radiation balance, Cloud physics, Ice crystal optics, Ice crystal size, Ice crystal structure, Attenuation, Radiometry, Mathematical models, Spaceborne photography

53-2059

**Apparatus for measuring the growth velocity of dendritic ice in undercooled water.**

Ohsaka, K., Trinh, E.H., *Journal of crystal growth*, Nov. 1998, 194(1), p.138-142, 9 refs.

Ice physics, Ice crystal growth, Dendritic ice, Velocity measurement, Temperature effects, Nucleation, Ice water interface, Solutions, Cavitation, Thermal diffusion, Instruments

53-2060

**Evaluation of ship-based electromagnetic-inductive thickness measurements of summer sea-ice in the Bellingshausen and Amundsen Seas, Antarctica.**

Haas, C., *Cold regions science and technology*, Feb. 1998, 27(1), p.1-16, 35 refs.

Oceanographic surveys, Sea ice, Ice cover thickness, Sounding, Electrical measurement, Profiles, Lasers, Pressure ridges, Statistical analysis, Accuracy, Antarctica—Bellingshausen Sea, Antarctica—Amundsen Sea

53-2061

**Extensive measurements of snow depth using FM-CW radar.**

Holmgren, J., Sturm, M., Yankielun, N.E., Koh, G., MP 5284, *Cold regions science and technology*, Feb. 1998, 27(1), p.17-30, 15 refs.

Snow surveys, Tundra terrain, Radar echoes, Snow depth, Probes, Computerized simulation, Spectra, Data processing, Statistical analysis, Filters, Accuracy

A sled-mounted X-band FM-CW radar and field data reduction system was developed and field tested. An integral part of the measurement program was the use of a computer algorithm to pick peak radar amplitudes, which were needed to convert radar data into depths in the field. A set of field protocols, designed to collocate radar and hand-probe depth measurements, were used with the algorithm to locally calibrate the radar because, without local calibration, depths were unreliable. Mean snow depths determined using the calibrated radar agreed with mean depths determined by hand to within 3% but had a consistently larger variance because of radar measurement errors. An analysis of the errors indicates that they are random and can be removed by filtering using an Optimal (Wiener) filter, thereby producing both the same mean and variance in snow depth from the radar as that obtained by hand-probing.

53-2062

**Fracture mechanics approach to penetration of surface crevasses on glaciers.**

Van der Veen, C.J., *Cold regions science and technology*, Feb. 1998, 27(1), p.31-47, 33 refs.

Glacier ice, Ice mechanics, Glacier surfaces, Calving, Crevasses, Water level, Meltwater, Crack propagation, Orientation, Stress concentration, Tensile properties, Elastic properties

53-2063

**Review of insect survival in frozen soils with particular reference to soil-dwelling stages of corn rootworms.**

Ellsbury, M.M., Pikul, J.L., Jr., Woodson, W.D., *Cold regions science and technology*, Feb. 1998, 27(1), p.49-56, 49 refs.

Frozen ground mechanics, Freeze thaw cycles, Biomass, Damage, Cold weather survival, Distribution, Soil temperature, Temperature effects, Countermeasures

53-2064

**Model tests of a submerged turret loading concept in level ice, broken ice and pressure ridges.**

Løset, S., Kanestrøm, Ø., Pytte, T., *Cold regions science and technology*, Feb. 1998, 27(1), p.57-73, 16 refs.

Ships, Moorings, Loads (forces), Ice cover effect, Pressure ridges, Statistical analysis, Mechanical tests, Simulation, Models

53-2065

**Natural abundance of carbon and nitrogen isotopes in potential sources of organic matter to soils of Taylor Valley, Antarctica.**

Burkins, M.B., Chamberlain, C.P., Virginia, R.A., Freckman, D.W., *Antarctic journal of the United States*, 1996, 31(2), p.209-210, 6 refs.

Soil surveys, Soil chemistry, Desert soils, Geochemistry, Isotope analysis, Carbon isotopes, Nutrient cycle, Ecology, Antarctica—Taylor Valley

53-2066

**Role of phytoplankton extracellular release in bacterioplankton growth of Taylor Valley Lakes, Antarctica.**

Takacs, C.D., Priscu, J.C., *Antarctic journal of the United States*, 1996, 31(2), p.211-212, 7 refs.

Limnology, Plankton, Photosynthesis, Bacteria, Microbiology, Plant physiology, Frozen lakes, Water chemistry, Ecology, Antarctica—Bonney, Lake, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake

53-2067

**Microbially mediated transformations of manganese in Lake Vanda.**

Bratina, B.J., Schmidt, T.M., Green, W.J., *Antarctic journal of the United States*, 1996, 31(2), p.213-214, 9 refs.

Microbiology, Limnology, Geochemistry, Water chemistry, Frozen lakes, Antarctica—Vanda, Lake

53-2068

**Lake-ice algal phototroph community composition and growth rates, Lake Bonney, dry valley lakes, Antarctica.**

Pinckney, J.L., Pearl, H.W., *Antarctic journal of the United States*, 1996, 31(2), p.215-216, 4 refs.

Lake ice, Plant physiology, Algae, Biomass, Microbiology, Chemical analysis, Bacteria, Ice cover effect, Frozen lakes, Antarctica—Bonney, Lake

53-2069

**Photosynthetic characteristics of cyanobacteria in permanent ice covers on lakes in the McMurdo Dry Valleys, Antarctica.**

Fritsen, C.H., Priscu, J.C., *Antarctic journal of the United States*, 1996, 31(2), p.216-218, 4 refs.

Limnology, Frozen lakes, Ice cover effect, Plant physiology, Microbiology, Bacteria, Photosynthesis, Ice composition, Sediments, Algae, Light (visible radiation), Antarctica—McMurdo Dry Valleys

53-2070

**Nitrogen fixation within permanent ice covers on lakes in the McMurdo Dry Valleys, Antarctica.**

Grue, A.M., Fritsen, C.H., Priscu, J.C., *Antarctic journal of the United States*, 1996, 31(2), p.218-220, 7 refs.

Lake ice, Ice composition, Frozen lakes, Microbiology, Bacteria, Sediments, Ice cores, Limnology, Antarctica—McMurdo Dry Valleys

53-2071

**Ice aggregates as a microbial habitat in Lake Bonney, dry valley lakes, Antarctica: Nutrient-rich microzones in an oligotrophic ecosystem.**

Pearl, H.W., Pinckney, J.L., *Antarctic journal of the United States*, 1996, 31(2), p.220-222, 6 refs. Microbiology, Limnology, Plant physiology, Lake ice, Nutrient cycle, Bacteria, Frozen lakes, Geochemistry, Antarctica—Bonney, Lake

53-2072

**Antarctic lake-ice microbial consortia: origin, distribution, and growth physiology.**

Priscu, J.C., Fritsen, C.H., *Antarctic journal of the United States*, 1996, 31(2), p.223-224, 7 refs.

Microbiology, Lake ice, Frozen lakes, Limnology, Bacteria, Plant physiology, Algae, Sediments, Ice composition, Antarctica—Bonney, Lake

53-2073

**Cyanobacterial communities associated with mineral particles in antarctic lake ice.**

Gordon, D., Lanol, B., Giovannoni, S., Priscu, J.C., *Antarctic journal of the United States*, 1996, 31(2), p.224-225, 3 refs.

Limnology, Frozen lakes, Lake ice, Minerals, Microbiology, Chemical analysis, Antarctica—Bonney, Lake

53-2074

**Impacts of climate change on antarctic vascular plants: warming and ultraviolet-B radiation.**

Day, T.A., Grobe, C.W., Ruhland, C.T., *Antarctic journal of the United States*, 1996, 31(2), p.226-227, 7 refs.

Plant physiology, Climatic changes, Ultraviolet radiation, Air temperature, Photosynthesis, Global warming, Physiological effects, Antarctica—Antarctic Peninsula

53-2075

**Photoinhibition in antarctic phytoplankton by ultraviolet-B radiation in relation to column ozone values.**

Holm-Hansen, O., Villafañe, V.E., Helbling, E.W., *Antarctic journal of the United States*, 1996, 31(2), p.229-230, 4 refs.

Marine biology, Plant physiology, Ultraviolet radiation, Ozone, Biomass, Antarctica—Arthur Harbor

53-2076

**Correlation between ozone loss and volcanic aerosol at altitudes below 14 kilometers over McMurdo Station, Antarctica.**

Deshler, T., Nardi, B., Hofmann, D.J., Johnson, B.J., *Antarctic journal of the United States*, 1996, 31(2), p.231-233, 6 refs.

Aerosols, Volcanic ash, Ozone, Atmospheric composition, Air pollution, Stratosphere, Antarctica—McMurdo Station

53-2077

**Temporal variation of snow accumulation rate at two Ross Ice Shelf locations influenced by katabatic wind.**

Braaten, D.A., *Antarctic journal of the United States*, 1996, 31(2), p.235-236, 3 refs.

Snow accumulation, Variations, Wind factors, Ice shelves, Antarctica—Ross Ice Shelf

53-2078

**Recent trends in stratospheric temperatures during austral springtime.**

Dou, W.Y., Parish, T.R., *Antarctic journal of the United States*, 1996, 31(2), p.237-238, 6 refs.

Ozone, Air temperature, Stratosphere, Seasonal variations, Climatic changes, Statistical analysis, Antarctica

53-2079

**Infrared radiation studies of winter marine antarctic atmosphere.**

Simmons, J.L., Stamnes, K., Murcray, F., Liu, X., *Antarctic journal of the United States*, 1996, 31(2), p.260-261, 4 refs.

Infrared radiation, Low temperature research, Marine meteorology, Clouds (meteorology), Cloud cover, Polar atmospheres, Marine atmospheres, Radiation balance, Antarctica

53-2080

Support Office for Aerogeophysical Research (SOAR): West antarctic field activities (1994-1996).

Richter, T.G., Williams, J.L., Blankenship, D.D., Bell, R.E., *Antarctic journal of the United States*, 1996, 31(2), p.263-265, 4 refs.

Research projects, Geophysical surveys, Topographic surveys, Airborne equipment, Navigation, Aircraft, Antarctica

53-2081

Undergraduate research initiative: Antarctic marine geology and geophysics.

Domack, E.W., *Antarctic journal of the United States*, 1996, 31(2), p.265-266, 6 refs.

Research projects, Marine geology, Geophysical surveys, Education, Antarctica

53-2082

Geodesy and mapping program of the United States in Antarctica.

Mullins, J.L., Hothem, L.D., *Antarctic journal of the United States*, 1996, 31(2), p.267-268.

Research projects, Geodetic surveys, Mapping, Low temperature research, Antarctica

53-2083

Subsurface soil temperature measurements at McMurdo Station, Antarctica.

Tumeo, M.A., Cummings, M.A., *Antarctic journal of the United States*, 1996, 31(2), p.268-272, 4 refs.

Soil temperature, Frozen ground temperature, Oil spills, Soil patterns, Freeze thaw cycles, Subsurface investigations, Temperature measurement, Antarctica

53-2084

Fundamental cryobiology of human hematopoietic progenitor cells. I: Osmotic characteristics and volume distribution.

Gao, D.Y., et al, *Cryobiology*, Feb. 1998, 36(1), p.40-48, 44 refs.

Cryobiology, Physiological effects, Freezing, Preserving, Health

53-2085

Cold stress responses in mesophilic bacteria.

Panoff, J.M., Thamavongs, B., Guéguen, M., Boutibonnes, P., *Cryobiology*, Mar. 1998, 36(2), p.75-83, 89 refs.

Cryobiology, Cold stress, Low temperature research, Bacteria, Cold tolerance, Physiological effects

53-2086

Crystallization of ice in aqueous solutions of glycerol and dimethyl sulfoxide. 2: Ice crystal growth kinetics.

Hey, J.M., MacFarlane, D.R., *Cryobiology*, Sep. 1998, 37(2), p.119-130, 24 refs.

Cryobiology, Solutions, Ice crystal growth, Antifreezes

53-2087

Respiratory responses to chilling and freezing in two sub-Antarctic insects.

Block, W., Worland, M.R., Bale, J., *Cryobiology*, Sep. 1998, 37(2), p.163-166, 13 refs.

Cryobiology, Physiological effects, Cold stress, Freezing, Animals, Low temperature research, Cold tolerance, South Georgia

53-2088

Aggregate for traffic surfaces, manufacture of the aggregate, and method for incorporating the aggregate in bitumen-bonded traffic surfaces.

Kämereit, W., *Germany Patent Office. Patent*, Mar. 12, 1998, n.p., No.19638743.

Road icing, Bituminous concretes, Concrete pavements, Concrete aggregates, Frost resistance, Frost protection, Concrete admixtures, Chemical ice prevention, Antifreezes, Road maintenance

53-2089

Anti-freeze and de-icing composition.

Käs, G., *European Patent Office. Patent*, Mar. 4, 1998, n.p., No.826759.

Road icing, Salting, Chemical ice prevention, Antifreezes, Road maintenance

53-2090

Review of processes involved in the exchange of persistent organic pollutants across the air-sea interface.

Wania, F., Axelman, J., Broman, D., *Environmental pollution*, 1998, 102(1), p.3-23, Refs. p.18-23.

Marine atmospheres, Atmospheric circulation, Air water interactions, Atmospheric composition, Air pollution, Water pollution, Ocean currents, Nutrient cycle

53-2091

Effects of snow and ice on the environmental behaviour of hydrophobic organic chemicals.

Wania, F., Hoff, J.T., Jia, C.Q., Mackay, D., *Environmental pollution*, 1998, 102(1), p.25-41, Refs. p.38-41.

Air pollution, Water pollution, Soil pollution, Atmospheric circulation, Atmospheric composition, Scavenging, Snow composition, Snow impurities, Ice composition

53-2092

Chiral pesticides as tracers of air-surface exchange.

Bidleman, T.F., et al, *Environmental pollution*, 1998, 102(1), p.43-49, 23 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Water pollution, Soil pollution, Air water interactions, Soil air interface, Great Lakes

53-2093

Multi-year observations of organohalogen pesticides in the arctic atmosphere.

Halsall, C.J., et al, *Environmental pollution*, 1998, 102(1), p.51-62, 32 refs.

Polar atmospheres, Marine atmospheres, Atmospheric composition, Atmospheric circulation, Air pollution

53-2094

Bioaccumulation of organochlorines through a remote freshwater food web in the Canadian Arctic.

Kidd, K.A., Hesslein, R.H., Ross, B.J., Koczenski, K., Stephens, G.R., Muir, D.C.G., *Environmental pollution*, 1998, 102(1), p.91-103, Refs. p.101-103.

Air pollution, Air water interactions, Lake water, Water pollution, Limnology, Nutrient cycle, Canada—Northwest Territories—Peter Lake

53-2095

Interpretation for the thermodynamic features of ice Ih $\leftrightarrow$ ice XI transformation.

Johari, G.P., *Journal of chemical physics*, Dec. 1, 1998, 109(21), p.9543-9548, 28 refs.

High pressure ice, Ice crystal structure, Ice crystal growth, Molecular structure, Molecular energy levels, Phase transformations, Solid phases

53-2096

Hydrogen bonding in glassy liquid water from Raman spectroscopic studies.

Tulk, C.A., Klug, D.D., Branderhorst, R., Sharpe, P., Ripmeester, J.A., *Journal of chemical physics*, Nov. 15, 1998, 109(19), p.8478-8484, 38 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Amorphous ice, Vitreous ice, Ice spectroscopy

53-2097

Free energy calculations on systems of rigid molecules: an application to the TIP4P model of H<sub>2</sub>O.

Vlot, M.J., Huinink, J., Van der Eerden, J.P., *Journal of chemical physics*, Jan. 1, 1999, 110(1), p.55-61, 28 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice crystal structure, Ice crystal growth, Ice models, Phase transformations

53-2098

New analytic equation of state for liquid water.

Jeffery, C.A., Austin, P.H., *Journal of chemical physics*, Jan. 1, 1999, 9901, p.484-496, 46 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Phase transformations, Liquid phases, Supercooling, Homogeneous nucleation, Mathematical models

53-2099

Quantum cluster equilibrium theory of liquids: freezing of QCE/3-21G water to tetrakaidecahedral "Bucky-ice".

Ludwig, R., Weinhold, F., *Journal of chemical physics*, Jan. 1, 1999, 110(1), p.508-515, 28 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice crystal structure, Ice crystal growth, Ice models, Phase transformations

53-2100

Winter fluxes of CO<sub>2</sub> and CH<sub>4</sub> from subalpine soils in Rocky Mountain National Park, Colorado.

Mast, M.A., Wickland, K.P., Striegl, R.T., Clow, D.W., *Global biogeochemical cycles*, Dec. 1998, 12(4), p.607-620, 46 refs.

Wetlands, Mountain soils, Soil air interface, Soil microbiology, Soil chemistry, Nutrient cycle, Snow composition, Snow cover effect, Snow permeability, Snow air interface, United States—Colorado—Rocky Mountain National Park

53-2101

Soil carbon stocks and their rates of accumulation and loss in a boreal forest landscape.

Rapalee, G., Trumbore, S.E., Davidson, E.A., Harden, J.W., Veldhuis, H., *Global biogeochemical cycles*, Dec. 1998, 12(4), p.687-701, 39 refs.

Taiga, Forest soils, Soil microbiology, Soil chemistry, Soil air interface, Forest fires, Nutrient cycle, Biomass, Geochemical cycles

53-2102

Seasonal patterns and controls on net ecosystem CO<sub>2</sub> exchange in a boreal peatland complex.

Bubier, J.L., Crill, P.M., Moore, T.R., Savage, K., Varner, R.K., *Global biogeochemical cycles*, Dec. 1998, 12(4), p.703-714, 63 refs.

Peat, Wetlands, Tundra climate, Tundra vegetation, Plant physiology, Plant ecology, Snow cover effect, Nutrient cycle, Geochemical cycles, Biomass, Canada—Manitoba

53-2103

Stochastic appraisal of the annual carbon budget of a large circumboreal peatland, Rapid River Watershed, northern Minnesota.

Rivers, J.S., et al, *Global biogeochemical cycles*, Dec. 1998, 12(4), p.715-727, Refs. p.725-727.

Peat, Wetlands, Vegetation patterns, Nutrient cycle, Geochemical cycles, Biomass, Statistical analysis, United States—Minnesota—Rapid River Watershed

53-2104

Carbon dioxide fluxes in a northern fen during a hot, dry summer.

Schreuder, C.P., Rouse, W.R., Griffiths, T.J., Boudreau, L.D., Blanken, P.D., *Global biogeochemical cycles*, Dec. 1998, 12(4), p.729-740, 30 refs.

Peat, Wetlands, Vegetation patterns, Nutrient cycle, Geochemical cycles, Biomass, Canada—Manitoba

53-2105

Allerød—Younger Dryas Coleoptera from western Cape Breton Island, Nova Scotia, Canada.

Miller, R.F., *Canadian journal of earth sciences*, Jan. 1996, 33(1), p.33-41, With French summary. 45 refs.

Glaciation, Glacial deposits, Forest tundra, Forest lines, Tundra soils, Quaternary deposits, Fossils, Soil dating, Paleocology, Paleoclimatology, Canada—Nova Scotia—Cape Breton Island

53-2106

Multivariate mineralogical analyses of late Wisconsinan sediments in southwestern Yukon. [Analyses minéralogiques multivariées de sédiments du Wisconsinien supérieur au sud-ouest du Yukon]

Dewez, V., Geurts, M.A., *Canadian journal of earth sciences*, Jan. 1996, 33(1), p.42-51, In French with English summary. 40 refs.

Glacial geology, Glacial deposits, Quaternary deposits, Mineralogy, Lithology, Geochemistry, Canada—Yukon Territory—Ruby Range, Canada—Yukon Territory—Aishihik Basin

53-2107

Late Quaternary history of the Mackenzie-Beaufort region, Arctic Canada, from modelling of permafrost temperatures. 1. The onshore-offshore transition.

Taylor, A.E., Dallimore, S.R., Outcalt, S.I., *Canadian journal of earth sciences*, Jan. 1996, 33(1), p.52-61 + append., With French summary. Refs. p.58-60.

Marine geology, Marine deposits, Quaternary deposits, Sea level, Subsea permafrost, Permafrost origin, Permafrost heat transfer, Permafrost heat balance, Permafrost indicators, Permafrost dating, Frozen ground temperature, Paleoclimatology, Canada—Northwest Territories—Mackenzie Delta, Beaufort Sea

53-2108

Late Quaternary history of the Mackenzie-Beaufort region, Arctic Canada, from modelling of permafrost temperatures. 2. The Mackenzie Delta—Tuktoyaktuk Coastlands.

Taylor, A.E., Dallimore, S.R., Judge, A.S., *Canadian journal of earth sciences*, Jan. 1996, 33(1), p.62-71, With French summary. 37 refs.

Marine geology, Marine deposits, Quaternary deposits, Subsea permafrost, Permafrost thickness, Permafrost heat balance, Permafrost dating, Frozen ground temperature, Paleoclimatology, Canada—Northwest Territories—Mackenzie Delta, Canada—Northwest Territories—Tuktoyaktuk Coastlands, Beaufort Sea

53-2109

Optical-cell evidence for superheated ice under gas-hydrate-forming conditions.

Stern, L.A., Hogenboom, D.L., Durham, W.B., Kirby, S.H., Chou, I.M., *Journal of physical chemistry B*, Apr. 9, 1998, 102(15), p.2627-2632, 20 refs.

Clathrates, Hydrates, Superheated ice, Ice composition, Ice sublimation

53-2110

Environmental impact assessment of used snow transportation on human environment: road accidents and land use conflicts. [Évaluation de certains impacts du transport des neiges usées sur le milieu humain: accidents de la route et conflits sur l'utilisation du territoire]

Dériger, L., Delisle, C.E., André, P., Thouez, J.P., Fortin, É., Janelle, R., *Vecteur environnement*, Feb. 1998, 31(1), p.45-53, In French with English summary. 40 refs.

Snow removal, Snow disposal, Environmental impact, Accidents, Safety, Urban planning, Road maintenance, Canada—Quebec—Montreal

53-2111

New regulation on removal of polluted snow. End to discharge into streams in the year 2000. [Nouveau règlement sur l'élimination des neiges usées: fin des déversements dans les cours d'eau pour l'an 2000]

Tremblay, S., *Vecteur environnement*, Dec. 1997, 30(6), p.15-16, In French.

Snow impurities, Snow removal, Snow disposal, Water pollution, Environmental protection, Legislation, Canada—Quebec

53-2112

Synthesis of physico-chemical data of used snow in Quebec and their environmental impacts. [Synthèse des données physico-chimiques sur les neiges usées au Québec et leurs répercussions environnementales]

Delisle, C.E., Chenevier, C., André, P., *Vecteur environnement*, Dec. 1997, 30(6), p.33-44, In French with English summary. 22 refs.

Snow composition, Snow impurities, Snow removal, Snow disposal, Water pollution, Soil pollution, Environmental impact, Health, Urban planning, Canada—Quebec—Montreal

53-2113

Aquatic palynomorphs: reconstruction of Holocene sea-surface water masses in the eastern Laptev Sea. [Rekonstruktion der Oberflächenwassermassen der östlichen Laptevsee im Holozän anhand von aquatischen Palynomorphen]

Kunz-Pirrung, M., *Berichte zur Polarforschung*, 1998, No.281, 117p., In German with English summary. Refs. p.101-106.

Marine biology, Algae, Marine deposits, Bottom sediment, Paleoclimatology, Ocean currents, Statistical analysis, Paleoecology, Russia—Laptev Sea

53-2114

Modelling hydrogen-bonded crystal structures beyond resolution of diffraction methods.

Katrusiak, A., *Polish journal of chemistry*, Feb. 1998, 72(2), p.449-459, 31 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice crystal structure, X ray diffraction

53-2115

Satellite imaging polar aspects, effects of ice, snow and frost. WEAG Euclid CEPA 9, RTP 9.1, WP 25200. Final report.

Weydahl, D.J., *Norwegian Defence Research Establishment. Report*, Feb. 29, 1996, No.96/01122, 45p., PB97-101752, 37 refs.

Snow optics, Ice optics, Snow cover effect, Ice cover effect, Synthetic aperture radar, Radio echo soundings, Backscattering, Radar photography, Photographic reconnaissance, Terrain identification

53-2116

Dynamics of carbon resources in litters of southern taiga with different degrees of soil hydromorphism: the Central Forest Reserve.

Dorofeeva, E.I., Trofimov, S.I.A., *Doklady biological sciences*, Sep.-Oct. 1998, Vol.362, p.457-459, Translated from *Doklady Akademii nauk*. 8 refs.

Taiga, Litter, Podsol, Minerals, Peat, Decomposition, Soil classification, Forest soils, Swamps, Soil chemistry

53-2117

Sediments in arctic sea ice—entrainment, characterization and quantification. [Sedimente im arktischen Meer eis—Eintrag, Charakterisierung und Quantifizierung]

Lindemann, F., *Berichte zur Polarforschung*, 1998, No.283, 124p., In German with English summary. Refs. p.116-124.

Sea ice, Sediments, Suspended sediments, Sediment transport, Frazil ice, Polynyas, Ice composition, Ice rafting, Ice water interface, Arctic Ocean, Russia—Laptev Sea

53-2118

Longtime analysis of Antarctica's sea-ice from passive microwave data. [Langzeitanalyse der antarktischen Meer eisbedeckung aus passiven Mikrowellendaten]

Thomas, C.H., *Berichte zur Polarforschung*, 1998, No.284, 177p., In German with English summary. Refs. p.171-175.

Sea ice distribution, Spaceborne photography, Microwaves, Remote sensing, Greenhouse effect, Global change, Climatic changes, Models, Statistical analysis, Ice water interface, Antarctica—Ross Sea, Antarctica—Weddell Sea

53-2119

Use of RADARSAT data in the Canadian Ice Service.

Ramsay, B., Manore, M., Weir, L., Wilson, K., Bradley, D., *Canadian journal of remote sensing*, Mar. 1998, 24(1), p.36-42, With French summary. 5 refs. Ice surveys, Sea ice distribution, Ice conditions, Ice reporting, Ice navigation, Ice routing, Ice detection, Ice forecasting, Spaceborne photography, Synthetic aperture radar, Radar tracking, Data transmission, Canada

53-2120

Evaluation of multirate ERS-1 and multispectral Landsat imagery for wetland detection in southern Ontario.

Wang, J., Shang, J., Brisco, B., Brown, R.J., *Canadian journal of remote sensing*, Mar. 1998, 24(1), p.60-68, With French summary. 25 refs.

Wetlands, Vegetation patterns, Terrain identification, Geobotanical interpretation, Spaceborne photography, Synthetic aperture radar, Image processing, Canada—Ontario

53-2121

Demonstration of ERS tandem mission SAR interferometry for mapping land fast ice evolution.

Hirose, T., Vachon, P.W., *Canadian journal of remote sensing*, Mar. 1998, 24(1), p.89-92, With French summary. 5 refs.

Ice surveys, Sea ice distribution, Ice conditions, Fast ice, Ice cracks, Ice breakup, Ice forecasting, Spaceborne photography, Synthetic aperture radar, Canada—Northwest Territories—Resolute Channel

53-2122

Modelling of deep seated hill slope creep in permafrost.

Foriero, A., Ladanyi, B., Dallimore, S.R., Egginton, P.A., Nixon, F.M., *Canadian geotechnical journal*, Aug. 1998, 35(4), p.560-578, With French summary. 37 refs.

Permafrost structure, Permafrost thickness, Permafrost thermal properties, Frozen ground strength, Frozen ground thermodynamics, Ground ice, Periglacial processes, Slope processes, Talus, Solifluction, Soil creep, Mathematical models, Canada—Northwest Territories—Tuktoyaktuk

53-2123

Modeling soil freeze-thaw and ice effect on canal bank.

Zhang, Z.X., Kushwaha, R.L., *Canadian geotechnical journal*, Aug. 1998, 35(4), p.655-665, With French summary. 21 refs.

Channels (waterways), Channel stabilization, Banks (waterways), Bank protection (waterways), Ice push, Ice erosion, Soil freezing, Frost heave, Ice lenses, Soil tests, Freeze thaw tests, Frost protection, Soil stabilization

53-2124

Ice loads from first-year ice ridges and rubble fields.

Blanchet, D., *Canadian journal of civil engineering*, Apr. 1998, 25(2), p.206-219, With French summary. Refs. p.217-219.

Offshore structures, Ice solid interface, Ice loads, Ice pressure, Ice friction, Pressure ridges, Ice deformation, Ice cover strength, Ice breaking, Ice pileup

53-2125

Icing, frost and aircraft flight.

Kind, R.J., *Canadian aeronautics and space journal*, June 1998, 44(2), p.110-118, 3 refs.

Aircraft icing, Ice accretion, Glaze, Ice loads, Ice forecasting, Computerized simulation

53-2126

Composition for plant nutrition and protection against frost damage.

Artozon Sylvester, R.I., *U.S. Patent Office. Patent*, Apr. 8, 1997, n.p., USP-5,618,330.

Plant physiology, Agriculture, Frost protection, Antifreezes

53-2127

Ice- and snow-repellent roofing materials coated with photocatalyst-containing silicones.

Kitamura, A., Hayakawa, M., *Japan Patent Office. Patent*, June 16, 1998, n.p., No.98159264.

Roofs, Protective coatings, Chemical ice prevention, Waterproofing

53-2128

**Simulating the behavior of poorly understood continua using neural networks.**

Flood, I., *Artificial intelligence for engineering design, analysis and manufacturing*, Nov. 1996, 10(5), p.391-400, 9 refs.

DLC TA174.A78

Soil freezing, Ground thawing, Frost heave, Frozen ground settling, Computerized simulation

53-2129

**Sea change in the Arctic.**

Monastersky, R., *Science news*, Feb. 13, 1999, 155(7), p.104-106, 4 refs.

Climatic changes, Weather modification, Sea ice, Water temperature, Global warming, Arctic Ocean

53-2130

**<sup>13</sup>C-depleted carbon microparticles in >3700-Ma sea-floor sedimentary rocks from West Greenland.**

Rosing, M.T., *Science*, Jan. 29, 1999, 283(5402), p.674-676, 26 refs.

Rocks, Sediments, Greenland

53-2131

**Chemical analysis of polar stratospheric cloud particles.**

Schreiner, J., Voigt, C., Kohlmann, A., Arnold, F., Mauersberger, K., Larsen, N., *Science*, Feb. 12, 1999, 283(5404), p.968-970, 24 refs.

Polar stratospheric clouds, Chemical analysis, Airborne equipment, Remote sensing, Cloud physics

53-2132

**0.5-million-year record of millennial-scale climate variability in the North Atlantic.**

McManus, J.F., Oppo, D.W., Cullen, J.L., *Science*, Feb. 12, 1999, 283(5404), p.971-975, 37 refs.

Climatic changes, Sea ice distribution, Oxygen isotopes, Isotope analysis, Paleoclimatology, Marine deposits, Sediments, North Atlantic Ocean

53-2133

**Roofing materials having ice- and snow-repellent coatings.**

Machida, M., Hayakawa, M., *Japan Patent Office. Patent*, June 16, 1998, n.p., No.98159265.

Roofs, Protective coatings, Chemical ice prevention, Waterproofing

53-2134

**Snow-melting apparatus.**

Sajiki, H., *Japan Patent Office. Patent*, June 23, 1998, n.p., No.98168850.

Heat recovery, Artificial melting, Snow melting, Snow removal, Snow removal equipment

53-2135

**Materials preventing freezing of molten snow and coating materials and sheets and tiles and exterior materials and roofings and roads and defreezing apparatus therewith.**

Kakuta, K., *Japan Patent Office. Patent*, June 23, 1998, n.p., No.98168433.

Snowmelt, Antifreezes, Chemical ice prevention

53-2136

**Modified polysiloxanes, rubber compositions and tire tread rubber compositions containing the same with good wear and ice and wet skid resistance, and reactive plasticizers.**

Ishikawa, K., Yatsuyanagi, F., *World Intellectual Property Organization. Patent Cooperation Treaty. Patent*, July 9, 1998, n.p., No.9829473.

Tires, Rubber, Rubber ice friction, Skid resistance

53-2137

**Photophysiological evidence of nutrient limitation of platelet ice algae in McMurdo Sound, Antarctica.**

Robinson, D.H., Arrigo, K.R., Kolber, Z., Gosselin, M., Sullivan, C.W., *Journal of phycology*, Oct. 1998, 34(5), p.788-797, 49 refs.

Algae, Marine biology, Ice cover effect, Ice water interface, Acclimatization, Nutrient cycle, Photosynthesis, Light effects, Biomass, Antarctica—McMurdo Sound

53-2138

**Vertical flux of phytoplankton and particulate biogenic matter in the marginal ice zone of the Barents Sea in May 1993.**

Andreassen, I.J., Wassmann, P., *Marine ecology progress series*, Sep. 3, 1998, Vol.170, p.1-14, 63 refs.

Algae, Plankton, Marine biology, Ice cover effect, Ice edge, Ice water interface, Suspended sediments, Nutrient cycle, Biomass, Barents Sea

53-2139

**Proceedings.**

International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998, Lewkowicz, A.G., ed, Allard, M., ed, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, 1276p., Refs. passim. For individual papers see 53-2140 through 53-2327. For Russian versions of papers submitted to this conference see 53-2374 through 53-2401.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Permafrost hydrology, Permafrost origin, Permafrost dating, Permafrost indicators, Permafrost forecasting, Permafrost control, Permafrost preservation, Frozen ground thermodynamics, Frozen ground temperature, Frozen ground strength, Soil freezing, Ground ice, Periglacial processes, Active layer, Paleoclimatology

53-2140

**Material composition and strength characteristics of saline frozen soils.**

Aksenov, V.I., Klinova, G.I., Sheikin, I.V., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1-4, 3 refs.

Saline soils, Soil freezing, Unfrozen water content, Frozen ground temperature, Frozen ground thermodynamics, Frozen ground chemistry, Frozen ground strength

53-2141

**Temperature conditions for ice-wedge cracking: field measurements from Salluit, northern Québec.**

Allard, M., Kasper, J.N., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.5-12, 19 refs.

Tundra soils, Tundra terrain, Soil freezing, Frozen ground temperature, Frost action, Cracking (fracturing), Polygonal topography, Patterned ground, Ice wedges, Permafrost indicators, Canada—Quebec—Salluit

53-2142

**Influence of climatic, geodynamic and anthropogenic factors on permafrost conditions in Western Siberia.**

An, V.V., Deviatkin, V.N., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.13-17, 12 refs.

Oil wells, Gas wells, Permafrost distribution, Permafrost thickness, Permafrost thermal properties, Permafrost heat balance, Geothermy, Boreholes, Frozen ground temperature, Ground thawing, Global warming, Russia—Siberia

53-2143

**Seasonal structure of taliks beneath arctic streams determined with ground-penetrating radar.**

Arcone, S.A., Chacho, E.F., Delaney, A.J., MP 5285, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.19-24, 13 refs.

Floodplains, Permafrost beneath rivers, Permafrost surveys, Permafrost hydrology, Taliks beneath rivers, Electromagnetic prospecting, Radio echo soundings, Subsurface investigations, United States—Alaska—Sagavanirktok River

The authors interpret the structure and development of taliks beneath stream channels from 375-MHz ground-penetrating radar profiles obtained in Jan. and Apr. within the Sagavanirktok River floodplain in Alaska. The upper surfaces appear smooth, often show an ice layer, and vary in depth with channel bathymetry. Partial freezing within taliks appears to cause weak reflections from the talik surface, internal reflections, and a distorted talik radar image. The taliks shrink as they propagate downward through the winter. Some taliks completely freeze by mid-Apr. Others may exist at 3.7 m beneath a typical, 1.8-m deep frozen channel, and deeper beneath channels that do not freeze completely. The persistent though diminishing flow from drill holes demonstrates their permeability.

53-2144

**Contribution of shore thermoabrasion to the Laptev Sea sediment balance.**

Are, F.E., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.25-30, 32 refs.

Subsea permafrost, Permafrost weathering, Coastal topographic features, Shore erosion, Shoreline modification, Sediment transport, Russia—Laptev Sea

53-2145

**Evolution of permafrost in environments with rapid sedimentation and denudation.**

Basistyi, V.A., Buiskikh, A.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.31-34, 7 refs.

Permafrost origin, Permafrost weathering, Permafrost thickness, Permafrost dating, Permafrost heat balance, Frozen rock temperature, Tectonics, Paleoclimatology, Russia—Magadan

53-2146

**Processes of snow/permafrost-interactions at a high-mountain site, Murtèl/Corvatsch, eastern Swiss Alps.**

Bernhard, L., Sutter, F., Haeberli, W., Keller, F., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.35-41, 23 refs.

Rock glaciers, Periglacial processes, Snow heat flux, Snow melting, Snow thermal properties, Snow cover effect, Active layer, Permafrost heat balance, Switzerland

53-2147

**Migration of petroleum contaminants into permafrost.**

Biggar, K.W., Nahir, M., Haidar, S., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.43-49, 9 refs.

Oil spills, Soil pollution, Water pollution, Permafrost hydrology, Permafrost preservation, Frozen ground chemistry, Permeability, Seepage, Soil water migration

53-2148

**Statistical investigations of shallow permafrost by electromagnetic profiling.**

Bobrov, N.I.U., Krylov, S.S., Soroka, I.V., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.51-55, 5 refs.

Permafrost surveys, Permafrost samplers, Permafrost structure, Ground ice, Ice detection, Electromagnetic prospecting, Russia—Yamal Peninsula

53-2149

**Nature, occurrence and origin of dry permafrost.**

Bockheim, J.G., Tarnocai, C., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.57-63, 61 refs.

Permafrost hydrology, Permafrost origin, Permafrost thickness, Permafrost distribution, Permafrost indicators, Permafrost dating, Active layer, Frozen ground temperature, Desert soils, Desiccation, Antarctica—McMurdo Dry Valleys

53-2150

**Climatological and hydrological influences on stable hydrogen and oxygen isotopes of active layer waters, Levinson-Lessing Lake area, Taymyr Peninsula.**

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Permafrost hydrology, Active layer, Soil water, Frozen ground chemistry, Hydrogeochemistry, Precipitation (meteorology), Isotope analysis, Paleoclimatology, Russia—Taymyr Peninsula

53-2151

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Permafrost hydrology, Alassy, Thermokarst development, Thermokarst lakes, Climatic changes, Climatic factors, Russia—Yakutia

53-2152

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Soil freezing, Ground ice, Ice needles, Ice formation, Ice crystal growth, Periglacial processes, Frost action, Cryoturbation, Sorting, Soil structure, Soil profiles, Grain size

53-2153

**Characterization and mapping of the permafrost zone on land based seismic reflection data, Canadian Arctic Islands.**

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Gas wells, Hydrates, Exploration, Seismic surveys, Permafrost surveys, Permafrost thickness, Permafrost bases, Permafrost dating, Bedrock, Stratigraphy, Canada—Northwest Territories—Arctic Archipelago

53-2154

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Permafrost surveys, Permafrost distribution, Glacial till, Moraines, Glacial deposits, Periglacial processes, Cryogenic soils, Soil surveys, Soil formation, Soil profiles, Soil classification, Canada—Northwest Territories—Baffin Island

53-2155

**Seasonal pipe movement in permafrost terrain, KP2 study site, Norman Wells pipeline.**

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Underground pipelines, Permafrost beneath structures, Permafrost preservation, Permafrost control, Frost heave, Frozen ground settling, Canada—Northwest Territories—Norman Wells

53-2156

**Electrical potentials measured during growth of lake ice, Mackenzie Delta area, N.W.T., Canada.**

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Lake ice, Ice electrical properties, Freezing potential (electrical), Ice water interface, Freezeup, Ice formation, Ice growth, Freezing front, Freezing rate, Canada—Northwest Territories—Mackenzie Delta

53-2157

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Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Permafrost dating, Permafrost forecasting, Active layer, Frozen ground temperature, Soil air interface, Paleoclimatology, Climatic changes, Global warming

53-2158

**Permafrost properties in the McMurdo Sound-Dry Valley region of Antarctica.**

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost weathering, Active layer, Frozen ground temperature, Frozen ground chemistry, Soil water, Salinity, Antarctica—McMurdo Dry Valleys

53-2159

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Permafrost surveys, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Active layer, Soil air interface, Ground ice, Ground thawing, Thaw depth, Canada—Northwest Territories—Resolute

53-2160

**Investigation of the microstructure of frozen soil at fatigue failure under dynamic cycling load with confining pressure.**

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Clay soils, Frozen ground strength, Frozen ground compression, Soil structure, Microstructure, Soil creep, Dynamic loads, Soil tests, Strain tests

53-2161

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Saline soils, Soil structure, Soil creep, Frozen ground chemistry, Frozen ground strength

53-2162

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Soil freezing, Freezing front, Soil water migration, Frozen ground thermodynamics, Frost heave

53-2163

**Tritium in Siberian permafrost.**

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Permafrost surveys, Permafrost samplers, Permafrost hydrology, Permafrost dating, Active layer, Ground ice, Ice composition, Frozen ground chemistry, Soil water migration, Russia—Siberia

53-2164

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Permafrost distribution, Permafrost beneath structures, Permafrost preservation, Permafrost control, Buildings, Foundations, Settlement (structural), Mongolia

53-2165

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Bridges, Piers, Piles, Foundations, Subsea permafrost, Permafrost beneath structures, Ice loads, Ice control, Pile load tests, United States—Alaska—Prudhoe Bay

53-2166

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Waste disposal, Soil pollution, Frozen ground chemistry, Ground ice, Ice composition, Impurities, Permeability, Ion diffusion

53-2167

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Saline soils, Soil freezing, Frozen ground chemistry, Soil water migration, Ion diffusion

53-2168

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Permafrost surveys, Geocryology, Research projects, International cooperation, Data processing, Data transmission

53-2169

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Exploration, Natural gas, Hydrates, Gas wells, Well logging, Subsea permafrost, Stratigraphy, Canada—Northwest Territories—Mackenzie Delta

53-2170

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost structure, Ground ice, Ice lenses, Ice wedges, Ice volume, Canada—Northwest Territories—Eureka

53-2171

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Exploration, Natural gas, Hydrates, Gas wells, Well logging, Subsea permafrost, Permafrost structure, Permafrost thickness, Frozen ground chemistry, Canada—Northwest Territories—Mackenzie Delta

53-2172

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Marine geology, Subsea permafrost, Permafrost distribution, Permafrost thickness, Permafrost origin, Permafrost dating, Sea level, Paleoclimatology, Pleistocene, Russia—Laptev Sea, Russia—East Siberian Sea, Chukchi Sea

53-2173

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Marine geology, Seismic surveys, Subsea permafrost, Permafrost distribution, Permafrost thickness, Permafrost origin, Permafrost indicators, Permafrost dating, Permafrost heat balance, Paleoclimatology, Russia—Laptev Sea

53-2174

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Tunnels, Frozen rock temperature, Frozen rock strength, Permafrost forecasting, Permafrost control, Frost protection, Thermal insulation, China—Qilian Mountains

53-2175

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Permafrost distribution, Permafrost thickness, Permafrost heat balance, Permafrost forecasting, Active layer, Frozen ground temperature, Ground thawing, Global warming, China

53-2176

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Frozen ground temperature, Frost penetration, Thaw depth, Poland—Tatra Mountains

53-2177

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Clay soils, Soil structure, Soil freezing, Freezing front, Unfrozen water content, Soil water migration, Frozen ground strength, Frost resistance, Frost action

53-2178

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Permafrost hydrology, Thermokarst lakes, Thermokarst development, Lacustrine deposits, Permafrost dating, Soil dating, Palynology, Plant ecology, Revegetation, Paleobotany, Paleoclimatology, United States—Alaska—Barrow

53-2179

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Mapping, Data processing, Norway

53-2180

**Observations of permafrost-landscape dynamics related to anthropogenic disturbances, Yukechi study site, central Yakutia.**

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Permafrost surveys, Permafrost distribution, Permafrost preservation, Permafrost forecasting, Frozen ground settling, Ground thawing, Alasay, Thermokarst development, Thermokarst lakes, Global warming, Russia—Yakutia

53-2181

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Exploration, Gold, Sands, Frozen fines, Frozen ground chemistry, Permafrost mass transfer

53-2182

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Tracked vehicles, Environmental impact, Tundra soils, Soil erosion, Tundra vegetation, Vegetation patterns, Revegetation, Plant ecology, Permafrost weathering, Canada—Northwest Territories—Baffin Island

53-2183

**Induced polarization and resistivity logging in permafrost.**

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost thermal properties, Frozen ground temperature, Ground ice, Ice detection, Electromagnetic prospecting, Electrical logging, Canada—Quebec



## 53-2184

**Role of neotectonics in permafrost origin and features of the Baikal-Amur Mainline region, Russia.** Fotiev, S.M., Leibman, M.O., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.283-289, 13 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost structure, Permafrost indicators, Permafrost forecasting, Frozen ground temperature, Soil classification, Soil mapping, Tectonics, Topographic effects, Baykal Amur Railroad

## 53-2185

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## 53-2186

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost dating, Permafrost forecasting, Frozen ground temperature, Frost penetration, Thaw depth, Climatic changes, Canada—Manitoba—Thompson

## 53-2187

**Principal problems, progress, and directions of geophysical investigations in permafrost regions.** Frolov, A.D., Zykov, I.U.D., Snegirev, A.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.305-311, 7 refs. Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost structure, Permafrost indicators, Permafrost forecasting, Frozen ground temperature, Electrical logging, Electromagnetic prospecting, Russia—Yamal Peninsula

## 53-2188

**Century of temperature observations of soil climate: methods of analysis and long-term trends.** Gilichinski, D.A., et al, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.313-317. Weather stations, Meteorological data, Air temperature, Soil temperature, Active layer, Frost penetration, Thaw depth, Climatic changes, Global warming, Statistical analysis, Russia

## 53-2189

**Experimental investigation of air convection embankments for permafrost-resistant roadway design.**

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Permafrost beneath roads, Permafrost preservation, Permafrost heat transfer, Embankments, Soil stabilization, Soil air interface, Air flow, Convection, Road maintenance, Subgrade maintenance, United States—Alaska—Fairbanks

## 53-2190

**Rigid-ice model and stationary growth of ice.**

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Soil freezing, Freezing front, Frozen ground thermodynamics, Soil water migration, Ice lenses, Ground ice, Ice growth, Mathematical models

## 53-2191

**Origins of the ground ice in the ice-free lands of the northern foothills (northern Victoria Land, Antarctica).**

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Glacial deposits, Glacier ice, Talus, Periglacial processes, Permafrost surveys, Permafrost distribution, Permafrost origin, Fossil ice, Ground ice, Ice composition, Ice dating, Isotope analysis, Antarctica—Victoria Land

## 53-2192

**Delineation of discontinuous permafrost at Schefferville using RADARSAT in interferometric mode.**

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Terrain identification, Snow cover effect, Synthetic aperture radar, Spaceborne photography, Mapping, Canada—Quebec—Schefferville

## 53-2193

**Dangerous movement of an anthropogenic "rock glacier", Noril'sk region, northern Siberia.**

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Mining, Waste disposal, Tailings, Talus, Rock glaciers, Solifluction, Landslides, Mudflows, Slope protection, Soil stabilization, Avalanche forecasting, Russia—Noril'sk

## 53-2194

**Phase equilibrium and kinetics of saline soil water freezing.**

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Saline soils, Soil freezing, Ground thawing, Freezing front, Soil water migration, Frozen ground thermodynamics, Frozen ground chemistry, Phase transformations, Mathematical models

## 53-2195

**Design aspects of a buried oil pipeline on the Alaskan North Slope.**

Greenslade, J., Nixon, J.F., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.359-369, 10 refs.

Underground pipelines, Permafrost beneath structures, Permafrost control, Permafrost preservation, Frozen ground strength, Ground ice, Ice wedges, Frost heave, Frost protection, United States—Alaska—North Slope

## 53-2196

**Cryosol properties on permafrost: structure and dynamics.**

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Permafrost distribution, Permafrost origin, Permafrost weathering, Permafrost indicators, Permafrost dating, Active layer, Cryogenic soils, Soil formation, Soil classification, Paleoclimatology, Russia

## 53-2197

**Rock glacier inventory of the Italian Alps.**

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Rock glaciers, Glacier surveys, Periglacial processes, Permafrost indicators, Permafrost distribution, Ground ice, Mapping, Italy—Alps

## 53-2198

**Ice food depot cooled with a heat pump: a pre-feasibility study.**

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Permafrost thermal properties, Permafrost heat transfer, Ice thermal properties, Ice refrigeration, Cold storage, Artificial freezing, Heat pumps, Russia—Magadan

## 53-2199

**Problems of interaction between structures and permafrost: the example of headframe foundations.**

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## 53-2200

**Analysis of thermal measurements acquired in Nunavik: comparison of field data with numerical models.**

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Permafrost surveys, Permafrost thickness, Permafrost structure, Permafrost thermal properties, Permafrost heat transfer, Permafrost indicators, Permafrost forecasting, Active layer, Frozen ground temperature, Frozen ground thermodynamics, Mathematical models, Canada—Quebec

## 53-2201

**Ten years after drilling through the permafrost of the active rock glacier Murtel, eastern Swiss Alps: answered questions and new perspectives.**

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Rock glaciers, Permafrost surveys, Permafrost thickness, Permafrost structure, Permafrost indicators, Frozen ground temperature, Ground ice, Periglacial processes, Talus, Soil creep, Switzerland

53-2202

**GGD-Browse: bridging the gap between data descriptions and data.**

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Permafrost surveys, Geocryology, Research projects, Data processing, Data transmission

53-2203

**Measurement of soil motion in sorted circles, western Spitsbergen.**

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Periglacial processes, Frost action, Cryoturbation, Sorting, Patterned ground, Norway—Spitsbergen

53-2204

**Effects of the 1994 and 1995 forest fires on the slopes of the Norman Wells pipeline.**

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Forest fires, Underground pipelines, Permafrost beneath structures, Pipeline insulation, Permafrost preservation, Embankments, Slope stability, Soil stabilization, Land reclamation, Canada—Northwest Territories—Norman Wells

53-2205

**Permafrost age and thickness at Moskuslagoon, Spitsbergen.**

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Permafrost surveys, Subsea permafrost, Permafrost distribution, Permafrost thickness, Permafrost dating, Paleoclimatology, Norway—Spitsbergen

53-2206

**Pressures recorded during laboratory freezing and thawing of a natural silt-rich soil.**

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Soil freezing, Ground thawing, Freezing front, Soil temperature, Soil pressure, Soil water migration, Frozen ground thermodynamics, Frozen ground compression, Frozen ground strength, Frozen ground temperature, Frozen ground settling

53-2207

**Nonsorted circles on Plateau Mountain, S.W. Alberta, Canada.**

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Permafrost distribution, Active layer, Alpine tundra, Tundra soils, Periglacial processes, Frost heave, Frost action, Solifluction, Patterned ground, Canada—Alberta

53-2208

**Statistical analyses of frozen soil creep properties.**

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Soil freezing, Frozen ground thermodynamics, Frozen ground strength, Frozen ground compression, Soil creep, Statistical analysis

53-2209

**Seismic evidence for the depth extent of permafrost in shelf sediments of the Laptev Sea, Russian Arctic?**

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Marine geology, Marine deposits, Bottom sediment, Tectonics, Bottom topography, Earth crust, Seismic surveys, Subsea permafrost, Permafrost indicators, Permafrost distribution, Permafrost thickness, Permafrost origin, Permafrost dating, Russia—Laptev Sea

53-2210

**Biogeochemical survey of an arctic coastal wetland.**

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Wetlands, Ponds, Thermokarst lakes, Permafrost hydrology, Tundra terrain, Tundra climate, Tundra vegetation, Ecosystems, Ecology, Limnology, Nutrient cycle, United States—Alaska—Prudhoe Bay

53-2211

**Surface movement and internal deformation of ice-rock mixtures within rock glaciers at Pontresina-Schaffberg, Upper Engadin, Switzerland.**

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Rock glaciers, Periglacial processes, Permafrost thickness, Permafrost distribution, Permafrost indicators, Ground ice, Frozen rock temperature, Solifluction, Talus, Soil creep, Switzerland

53-2212

**Evaluation of ground penetrating radar for investigation of palsa evolution, Macmillan Pass, NWT, Canada.**

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Peat, Frost mounds, Periglacial processes, Ground ice, Permafrost hydrology, Permafrost indicators, Permafrost thickness, Permafrost structure, Electromagnetic prospecting, Canada—Northwest Territories—Macmillan Pass

53-2213

**Ground thermal regimes at a large earthwork reservoir on Baffin Island, Nunavut, Canada.**

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Reservoirs, Earthwork, Embankments, Water supply, Permafrost surveys, Permafrost heat balance, Permafrost thermal properties, Permafrost forecasting, Frozen ground temperature, Canada—Northwest Territories—Baffin Island

53-2214

**Origin of lake-bed ground ice at Water Supply Lake, Pond Inlet, Nunavut, Canada.**

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Lacustrine deposits, Bottom sediment, Permafrost beneath lakes, Permafrost origin, Permafrost dating, Ground ice, Ice lenses, Fossil ice, Ice composition, Ice dating, Canada—Northwest Territories—Baffin Island

53-2215

**Mechanical and thermal stabilisation of fill materials for road embankment construction on discontinuous permafrost in northwest Russia.**

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Embankments, Earth fills, Subgrade soils, Soil trafficability, Frozen ground strength, Thaw depth, Thaw weakening, Soil stabilization, Discontinuous permafrost, Permafrost beneath roads, Permafrost thermal properties, Permafrost preservation, Road maintenance, Russia—Komi

53-2216

**Development of a distributed hydrological model for permafrost regions considering 1-D heat and water transfer and river flow processes.**

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Permafrost hydrology, Permafrost heat transfer, Permafrost heat balance, Frozen ground thermodynamics, Soil air interface, Moisture transfer, Hydrologic cycle, Atmospheric circulation, River flow, Stream flow, Runoff forecasting, Global change, Mathematical models, Computerized simulation, China—Qinghai-Xizang Plateau

53-2217

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Soil freezing, Freezing front, Frost penetration, Cooling rate, Soil water migration, Frost heave, Ice lenses, Soil tests, Mathematical models

53-2218

**Bench stability control in a deep diamond open pit mine using thermal insulation.**

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Mining, Pits (excavations), Frozen rock temperature, Slope stability, Slope protection, Soil stabilization, Permafrost preservation, Geotextiles, Thermal insulation, Russia—Yakutia

53-2219

**Design and construction of sewage lagoon in Grise Fiord, NWT.**

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Waste disposal, Sewage treatment, Sewage disposal, Ponds, Permafrost beneath lakes, Permafrost control, Excavation, Cost analysis, Canada—Northwest Territories—Ellesmere Island

## 53-2220

**Evolution of a permafrost-dominated landscape on the Colville River Delta, northern Alaska.**

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Deltas, Alluvium, Floodplains, Permafrost surveys, Permafrost beneath rivers, Permafrost distribution, Permafrost thickness, Permafrost structure, Permafrost origin, Permafrost dating, Periglacial processes, Ground ice, Patterned ground, Terrain identification, United States—Alaska—Colville River Delta

## 53-2221

**Surface deformation of creeping mountain permafrost: photogrammetric investigations on Murtèl rock glacier, Swiss Alps.**

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Rock glaciers, Slope processes, Periglacial processes, Permafrost thickness, Permafrost structure, Permafrost indicators, Solifluction, Talus, Soil creep, Photogrammetric surveys, Switzerland

## 53-2222

**Rainfall runoff of a nested watershed in the Alaskan Arctic.**

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Watersheds, River basins, Permafrost hydrology, Rain, Evapotranspiration, Water retention, Water storage, Water balance, Runoff forecasting, United States—Alaska—North Slope

## 53-2223

**Changes in permafrost conditions along linear engineering structures in the north-talga subzone of the arctic Yenisey area, Russia.**

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Power line supports, Railroads, Permafrost beneath structures, Permafrost beneath roads, Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost weathering, Thermokarst, Taliks, Russia—Yenisey River, Russia—Noril'sk, Russia—Igarka

## 53-2224

**Deformation analysis of the Doesen rock glacier (Austria).**

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Rock glaciers, Glacier surveys, Glacier thickness, Glacier flow, Periglacial processes, Talus, Soil creep, Photogrammetric surveys, Austria

## 53-2225

**Permafrost map of Switzerland.**

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Data processing, Computer applications, Mapping, Switzerland

## 53-2226

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Permafrost beneath structures, Permafrost control, Permafrost forecasting, Frozen ground strength, Frozen ground temperature, Foundations, Engineering geology, Computer programs

## 53-2227

**Permafrost distribution and implications for construction in the Zermatt area, Swiss Alps.**

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Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost forecasting, Permafrost beneath structures, Permafrost beneath roads, Permafrost control, Rock glaciers, Periglacial processes, Frozen ground temperature, Engineering geology, Computerized simulation, Switzerland

## 53-2228

**Occurrence of surface ice and ground ice/permafrost in recently deglaciated glacier forefields, St. Moritz area, eastern Swiss Alps.**

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Cirque glaciers, Rock glaciers, Periglacial processes, Ground ice, Fossil ice, Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost origin, Permafrost dating, Permafrost forecasting, Electromagnetic prospecting, Switzerland

## 53-2229

**Long-term influence of active-layer detachment sliding on permafrost slope hydrology, Hot Weather Creek, Ellesmere Island, Canada.**

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Permafrost hydrology, Active layer, Periglacial processes, Slope processes, Landslides, Solifluction, Snow depth, Snowmelt, Snow erosion, Soil erosion, Stream flow, Runoff, Water balance, Canada—Northwest Territories—Ellesmere Island

## 53-2230

**Relationship between the lithology of active-layer materials and mean annual ground temperature in the former USSR.**

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Permafrost distribution, Permafrost thermal properties, Frozen ground temperature, Frozen ground chemistry, Active layer, Periglacial processes, Permafrost weathering, Frost weathering, Soil formation, Cryogenic soils, Soil composition, Soil structure, Russia

## 53-2231

**Prediction of frost heave induced deformation of dyke KA-7 in northern Quebec.**

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Reservoirs, Embankments, Earth dams, Earth fills, Soil freezing, Frost heave, Slope stability, Frozen ground thermodynamics, Permafrost heat transfer, Permafrost forecasting, Frost forecasting, Computerized simulation, Canada—Quebec—Canapiscou

## 53-2232

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Petroleum industry, Economic development, Environmental impact, Environmental protection, Pipelines, Permafrost beneath structures, Permafrost preservation, Russia—Yakutia

## 53-2233

**Gravimetric investigation of mounded till deposits, central Victoria Island, Northwest Territories, Canada.**

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Geophysical surveys, Gravimetric prospecting, Glacial geology, Glacial deposits, Glacial till, Ground ice, Glacier ice, Fossil ice, Ice detection, Ice dating, Permafrost dating, Paleoclimatology, Canada—Northwest Territories—Victoria Island

## 53-2234

**Anomalous electrical properties of saline permafrost on the Yamal Peninsula, north-western Siberia, from field electromagnetic survey.**

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost indicators, Permafrost forecasting, Saline soils, Clay soils, Frozen ground chemistry, Electromagnetic prospecting, Russia—Yamal Peninsula

## 53-2235

**Experimental studies of the processes of ice formation and evaporation in air thermosyphons.**

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Permafrost beneath structures, Permafrost preservation, Permafrost heat transfer, Soil freezing, Artificial freezing, Soil stabilization, Cooling systems, Pipes (tubes), Air flow, Ice air interface, Ice prevention, Ice sublimation

53-2236

**Evolution of frost heaving stresses acting on a pile.**

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Piles, Pile load tests, Soil freezing, Frost penetration, Frost heave, Soil pressure, Frozen ground strength, Frozen ground compression, Mathematical models

53-2237

**Thaw depth measurements in marine saline sandy and clayey deposits of Yamal Peninsula, Russia: procedure and interpretation of results.**

Leibman, M.O., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.635-639, 2 refs.

Marine deposits, Saline soils, Clay soils, Active layer, Permafrost thickness, Permafrost thermal properties, Permafrost heat balance, Frozen ground temperature, Ground thawing, Thaw depth, Russia—Yamal Peninsula

53-2238

**Late-summer solifluction and active layer depths, Fosheim Peninsula, Ellesmere Island, Canada.**

Lewkowicz, A.G., Clarke, S., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.641-646, 18 refs.

Periglacial processes, Active layer, Permafrost thickness, Thaw depth, Frozen ground thermodynamics, Solifluction, Soil creep, Canada—Northwest Territories—Ellesmere Island

53-2239

**Modeling and predicting permafrost degradation due to climatic warming in the Huashixia Valley, eastern Qinghai-Tibet Plateau.**

Li, D.Q., Wu, Z.W., Fang, J.H., Wang, X.Y., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.647-650, 10 refs.

Permafrost distribution, Permafrost thickness, Permafrost heat balance, Permafrost forecasting, Ground thawing, Global warming, Long range forecasting, Mathematical models, China—Qinghai-Xizang Plateau

53-2240

**Simulation of the thermal regime of permafrost in northeast China under climate warming.**

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Permafrost distribution, Permafrost thickness, Permafrost thermal properties, Permafrost heat balance, Permafrost forecasting, Frozen ground temperature, Ground thawing, Global warming, Long range forecasting, Mathematical models, China

53-2241

**Response of permafrost to global change on the Qinghai-Xizang Plateau—a GIS-aided model.**

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Permafrost distribution, Permafrost heat balance, Permafrost forecasting, Global warming, Long range forecasting, Computerized simulation, China—Qinghai-Xizang Plateau

53-2242

**High-mountain permafrost in the Austrian Alps (Europe).**

Lieb, G.K., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.663-668, 11 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost indicators, Permafrost forecasting, Rock glaciers, Periglacial processes, Mapping, Data processing, Austria

53-2243

**Annual water balance for three nested watersheds on the North Slope of Alaska.**

Lilly, E.K., Kane, D.L., Hinzman, L.D., Gieck, R.E., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.669-674, 22 refs.

Watersheds, River basins, Permafrost hydrology, Water balance, Precipitation (meteorology), Snowfall, Snow water equivalent, Snowmelt, Stream flow, Runoff forecasting, Statistical analysis, United States—Alaska—North Slope

53-2244

**Dynamics of permafrost in northern Eurasia during the last 20,000 years.**

Lisitsyna, O.M., Romanovskii, N.N., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.675-681, 10 refs.

Permafrost distribution, Permafrost indicators, Permafrost origin, Permafrost dating, Permafrost forecasting, Periglacial processes, Fossil ice, Global change, Paleoclimatology

53-2245

**Permafrost of the Baikal-Patom Plateau.**

Litvin, V.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.683-687, 4 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost origin, Permafrost dating, Tectonics, Paleoclimatology, Russia—Baikal Range, Russia—Patom Plateau

53-2246

**Effect of convective heat transfer on thawing of frozen soil.**

Lunardini, V.J., MP 5286, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.689-695, 13 refs.

Ground thawing, Frozen ground thermodynamics, Permafrost heat transfer, Soil water migration, Convection, Thawing rate, Thaw depth, Stefan problem, Mathematical models

Most analyses of the thawing of frozen soil are based on purely conductive heat transfer, a very good assumption in most cases, but vertical and horizontal water flows occur frequently in permafrost regions. The effect of vertical water movement on the rate of thaw and the thermal regime of the soil is quantified. An exact similarity solution only occurs when the vertical water velocity is proportional to the rate of thaw. This solution indicates that seepage flows (the magnitude of the water velocity is near that of the rate of thaw) have little effect upon the thaw process. Approximate solutions are also given for the case of constant water velocity, using the heat balance integral and quasi-steady methods; they agree with the exact solution if the Stefan number is not too large. Thaw can be greatly accelerated or retarded if the water velocity (Peclet number) is large. The effect upon thawing for the case of horizontal water flow is less than that for the same magnitude of vertical flow.

53-2247

**Monitoring the change of structures in frozen soil during the triaxial creep process by computer tomography.**

Ma, W., Wu, Z.W., Pu, Y.P., Chang, X.X., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.697-701, 5 refs.

Frozen ground strength, Frozen ground compression, Soil structure, Soil creep, X ray analysis, Computer applications

53-2248

**Constraint to the methane gas hydrate stability from the analysis of thermal data in the northern Canadian sedimentary basins—Arctic Archipelago case.**

Majorowicz, J.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.703-709, 18 refs.

Hydrates, Natural gas, Exploration, Well logging, Subsea permafrost, Permafrost heat balance, Bottom sediment, Global warming, Canada—Northwest Territories—Arctic Archipelago

53-2249

**Role of diurnal, annual and millennial freeze-thaw cycles in controlling alpine slope instability.**

Matsuoka, N., Kirakawa, K., Watanabe, T., Haeberli, W., Keller, F., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.711-717, 17 refs.

Permafrost origin, Permafrost heat balance, Permafrost weathering, Periglacial processes, Frost weathering, Slope stability, Slope processes, Rock glaciers, Talus, Solifluction, Landslides, Climatic changes, Paleoclimatology, Switzerland

53-2250

**Uniting basis for creation of ecological maps for the Russian cryolithozone.**

Mel'nikov, E.S., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.719-722, 15 refs.

Permafrost surveys, Permafrost distribution, Mapping, Terrain identification, Data processing, Russia

53-2251

**Monitoring of ground surface temperatures in various biophysical micro-environments near Umiuq, eastern Hudson Bay, Canada.**

Ménard, É., Allard, M., Michaud, Y., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.723-729, 23 refs.

Permafrost surveys, Permafrost distribution, Permafrost indicators, Permafrost thermal properties, Permafrost forecasting, Frozen ground temperature, Soil temperature, Surface temperature, Degree days, Frost penetration, Thaw depth, Snow depth, Snow cover effect, Vegetation factors, Mapping, Canada—Quebec

53-2252

**Spatial and temporal patterns of soil moisture and thaw depth at Barrow, Alaska, U.S.A.**

Miller, L.L., Hinkel, K.M., Nelson, F.E., Paetzold, R.F., Outcalt, S.I., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.731-737, 16 refs.

Permafrost hydrology, Permafrost thickness, Active layer, Soil water, Thaw depth, United States—Alaska—Barrow

- 53-2253**  
**Thermal assessment of passive cooled foundation soils beneath the Trans-Alaska Pipeline at Atigun Pass.**  
Mobley, K.F., Fitzpatrick, M.R., Ferrell, J.E., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.739-743, 5 refs. Underground pipelines, Permafrost beneath structures, Permafrost heat transfer, Permafrost thermal properties, Permafrost preservation, Frozen ground temperature, Heat pipes, Cooling systems, Artificial freezing, Soil stabilization, United States—Alaska—Atigun Pass
- 53-2254**  
**Svalbard Airport geotechnical study: engineering methodology and results.**  
Møllmann, T., Bergheim, B., Valeriot, M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.745-755, 1 ref. Airports, Runways, Site surveys, Permafrost surveys, Permafrost beneath roads, Permafrost thickness, Permafrost heat transfer, Permafrost control, Frozen ground temperature, Frozen ground settling, Thermal insulation, Soil stabilization, Norway—Spitsbergen
- 53-2255**  
**Development of tabular massive ground ice at Peninsula Point, N.W.T., Canada.**  
Moorman, B.J., Michel, F.A., Wilson, A.T., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.757-762, 19 refs. Ground ice, Ice lenses, Fossil ice, Ice composition, Ice dating, Permafrost dating, Paleoclimatology, Canada—Northwest Territories—Mackenzie Delta
- 53-2256**  
**Impact of vegetation removal and its recovery after disturbance on permafrost.**  
Moskalenko, N.G., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.763-769, 12 refs. Vegetation patterns, Vegetation factors, Revegetation, Soil erosion, Soil conservation, Land reclamation, Permafrost weathering, Permafrost preservation, Russia—Siberia
- 53-2257**  
**Soil temperature regimes and microtopographic contrasts, Baffin Island, N.W.T., Canada.**  
Müller, G., Broll, G., Tarnocai, C., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.771-775, 21 refs. Permafrost hydrology, Permafrost heat transfer, Permafrost thermal properties, Permafrost thickness, Active layer, Soil temperature, Frozen ground temperature, Degree days, Canada—Northwest Territories—Baffin Island
- 53-2258**  
**Dating of thermokarst terrain, pleistocene Mackenzie Delta, Canada.**  
Murton, J.B., French, H.M., Lamothe, M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.777-782, 43 refs. Permafrost thickness, Permafrost origin, Permafrost dating, Active layer, Thermokarst development, Soil dating, Ground ice, Fossil ice, Ice dating, Paleoclimatology, Canada—Northwest Territories—Mackenzie Delta
- 53-2259**  
**Microscopic observation of ice lensing and frost heave in glass beads.**  
Mutou, Y., Watanabe, K., Ishizaki, T., Mizoguchi, M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.783-787, 8 refs. Soil freezing, Freezing front, Freezing rate, Soil water migration, Ice microstructure, Ice lenses, Frost heave
- 53-2260**  
**Development and testing of a thermal-mechanical numerical model for predicting arctic shore erosion processes.**  
Nairn, R.B., Solomon, S.M., Kobayashi, N., Viridine, J., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.789-795, 17 refs. Marine geology, Ocean waves, Sea level, Subsea permafrost, Permafrost weathering, Permafrost heat transfer, Ground thawing, Shore erosion, Computerized simulation, Beaufort Sea
- 53-2261**  
**Spatial and temporal attributes of the active-layer thickness record, Barrow, Alaska, U.S.A.**  
Nelson, F.E., Outcalt, S.I., Brown, J., Shiklomanov, N.I., Hinkel, K.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.797-802, 31 refs. Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Active layer, Thaw depth, Climatic changes, Permafrost forecasting, United States—Alaska—Barrow
- 53-2262**  
**Russian and North American approaches to pile design in relation to frost action.**  
Nidowicz, B., Shur, I.U., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.803-809, 23 refs. Piles, Pile load tests, Foundations, Permafrost beneath structures, Permafrost control, Soil freezing, Frost heave, Frozen ground strength, Frost resistance, Frost protection, Design criteria
- 53-2263**  
**Damage model of frozen soil under multi-axial state stress.**  
Niu, Y.H., Miao, T.D., Zhang, C.Y., Zhang, J.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.811-814, 9 refs. Frozen ground strength, Frozen ground compression, Soil creep, Strain tests, Cracking (fracturing), Ultimate strength, Mathematical models
- 53-2264**  
**Regional active layer monitoring across the sporadic, discontinuous and continuous permafrost zones, Mackenzie Valley, northwestern Canada.**  
Nixon, F.M., Taylor, A.E., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.815-820, 27 refs. Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost forecasting, Active layer, Thaw depth, Degree days, Climatic changes, Statistical analysis, Canada—Northwest Territories—Mackenzie River
- 53-2265**  
**Pipe uplift resistance testing in frozen soil.**  
Nixon, J.F., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.821-831, 6 refs. Underground pipelines, Frozen ground strength, Frozen ground compression, Soil creep, Frost heave, Freeze thaw tests, Strain tests
- 53-2266**  
**Recent applications of geothermal analysis in northern engineering.**  
Nixon, J.F., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.833-846, 17 refs. Mining, Tailings, Underground pipelines, Permafrost beneath structures, Permafrost thermal properties, Permafrost heat transfer, Permafrost heat balance, Permafrost forecasting, Permafrost control, Frozen ground thermodynamics, Frozen ground temperature, Frost penetration, Frost heave, Thermal analysis
- 53-2267**  
**Permafrost dynamics at the Rogovaya River peat plateau, subarctic Russia.**  
Oksanen, P.O., Kuhry, P., Alekseeva, R.N., Kanev, V.V., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.847-854, 25 refs. Wetlands, Peat, Tundra vegetation, Vegetation patterns, Plant ecology, Paleobotany, Soil dating, Permafrost distribution, Permafrost origin, Permafrost dating, Paleoclimatology, Russia—Bol'shezemel'skaya Tundra
- 53-2268**  
**Permafrost as a frozen geochemical barrier.**  
Ostroumov, V.E., Siegert, C., Alekseev, A., Demidov, V.V., Alekseeva, T., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.855-859, 10 refs. Permafrost hydrology, Permafrost structure, Active layer, Soil water migration, Seepage, Permeability, Geochemical cycles, Geochemistry, Frozen ground chemistry
- 53-2269**  
**Update of performance of slopes on the Norman Wells pipeline project.**  
Oswell, J.M., Hanna, A.J., Doblanco, R.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.861-867, 6 refs. Underground pipelines, Permafrost beneath structures, Permafrost thickness, Permafrost weathering, Permafrost control, Permafrost preservation, Frost penetration, Thaw depth, Frozen ground settling, Embankments, Slope stability, Soil stabilization, Pipeline insulation, Canada—Northwest Territories—Norman Wells
- 53-2270**  
**Estimating the magnitude of coupled-flow effects in the active layer and upper permafrost, Barrow, Alaska, U.S.A.**  
Outcalt, S.I., Hinkel, K.M., Nelson, F.E., Miller, L.L., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.869-873, 15 refs. Permafrost hydrology, Permafrost heat transfer, Frozen ground thermodynamics, Frozen ground temperature, Active layer, Soil temperature, Soil water migration, Soil air interface, Evaporation, United States—Alaska—Barrow

53-2271

**Active layer monitoring in northern West Siberia.**

Pavlov, A.V., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.875-881, 11 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Permafrost forecasting, Active layer, Degree days, Ground thawing, Thaw depth, Russia—Yamal Peninsula, Russia—Gydan Peninsula

53-2272

**Linear stability analysis for the inception of differential frost heave.**

Peterson, R.A., Krantz, W.B., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.883-889, 21 refs.

Soil freezing, Freezing front, Frost penetration, Freezing rate, Frost heave, Frozen ground thermodynamics, Periglacial processes, Patterned ground

53-2273

**Driven piles in warm permafrost.**

Phukan, A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.891-895, 8 refs.

Houses, Foundations, Steel structures, Piles, Pile driving, Permafrost beneath structures, Permafrost control, United States—Alaska—Bethel, United States—Alaska—Kongiganak

53-2274

**Numerical model for the organization of ice-wedge networks.**

Plug, L.J., Werner, B.T., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.897-902, 17 refs.

Periglacial processes, Ice wedges, Polygonal topography, Patterned ground, Permafrost indicators, Frozen ground strength, Crack propagation, Fractals, Computerized simulation, United States—Alaska—Esenberg, Cape, United States—Alaska—Brooks Range

53-2275

**Massive ice formation in the Eureka Sound lowlands: a landscape model.**

Pollard, W.H., Bell, T., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.903-908, 12 refs.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Permafrost distribution, Permafrost structure, Permafrost origin, Permafrost indicators, Permafrost dating, Periglacial processes, Ground ice, Fossil ice, Paleoclimatology, Canada—Northwest Territories—Ellesmere Island

53-2276

**Geomorphic and hydrologic characteristics of perennial springs on Axel Heiberg Island, Canadian High Arctic.**

Pollard, W.H., Omelon, C., Andersen, D., McKay, C., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.909-914, 17 refs.

Permafrost hydrology, Subpermafrost ground water, Suprapermafrost ground water, Taliks, Springs (water), Hydrogeochemistry, Water chemistry, Canada—Northwest Territories—Axel Heiberg Island

53-2277

**Frost weathering in a mountain permafrost area (Plateau Mountain, Alberta, Canada).**

Prick, A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.915-920, 23 refs.

Periglacial processes, Frost weathering, Permafrost weathering, Frozen rock strength, Talus, Canada—Alberta—Plateau Mountain

53-2278

**Meltwater fluxes, hillslope runoff and stream flow in an arctic permafrost basin.**

Quinton, W.L., Marsh, P., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.921-926, 19 refs.

River basins, Snow hydrology, Snowmelt, Seepage, Permafrost hydrology, Stream flow, Runoff forecasting, Canada—Northwest Territories—Mackenzie Delta

53-2279

**Thermokarst vegetation in lowland birch forests on the Tanana Flats, interior Alaska, U.S.A.**

Racine, C.H., Jorgenson, M.T., Walters, J.C., MP 5287, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.927-933, 15 refs.

Permafrost hydrology, Ground thawing, Thermokarst development, Taiga, Forest ecosystems, Wetlands, Swamps, Peat, Paludification, Vegetation patterns, Revegetation, Plant ecology, United States—Alaska—Fairbanks, United States—Alaska—Tanana River

The thawing of ice-rich permafrost beneath birch forests in the Tanana Flats area of interior Alaska has produced thermokarst features colonized by a range of species and wetland vegetation types. As the forest drowns along its border with fens, an open-water moat is colonized by minerotrophic species and a floating mat develops. At the same time, thawing in the birch forest interior produces water-filled pits and collapse scar bogs in which ombrotrophic vegetation develops through several stages to Sphagnum bogs. As the thawing front moves into the birch forest from the fen, these latter features are incorporated into the floating mat, accelerating the expansion of fens.

53-2280

**Exploring the limits of permafrost.**

Riseborough, D.W., Smith, M.W., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.935-941, 12 refs.

Permafrost distribution, Permafrost heat transfer, Permafrost heat balance, Permafrost indicators, Permafrost forecasting, Snow cover effect, Soil freezing, Ground thawing, Frozen ground thermodynamics, Frozen ground temperature, Mathematical models

53-2281

**Regional characteristics of subfluvial talik formation and structure, Yamal Peninsula, Russia.**

Rivkin, F.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.943-947, 1 ref.

Permafrost hydrology, Permafrost heat balance, Snow cover effect, Ground thawing, Taliks beneath rivers, Taliks beneath lakes, Russia—Yamal Peninsula

53-2282

**Massive ground ice within Eureka Sound bedrock, Ellesmere Island, Canada.**

Robinson, S.D., Pollard, W.H., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.949-954, 16 refs.

Permafrost structure, Permafrost origin, Permafrost dating, Permafrost indicators, Bedrock, Frozen rock strength, Ground ice, Ice wedges, Ice lenses, Fossil ice, Ice composition, Ice dating, Hydrogeochemistry, Canada—Northwest Territories—Ellesmere Island

53-2283

**Ground ice and relief evolution on the islands and coasts of the Russian Arctic.**

Romanenko, F.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.955-959, 3 refs.

Periglacial processes, Slope processes, Ground ice, Thermokarst development, Permafrost weathering, Frozen ground settling, Subsidence, Shore erosion, Soil erosion, Sediment transport, Russia

53-2284

**Regularities of permafrost interaction with gas and gas hydrate deposits.**

Romanovskii, N.N., Tipenko, G.S., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.961-966, 11 refs.

Hydrates, Natural gas, Exploration, Subsea permafrost, Permafrost thickness, Permafrost structure, Permafrost heat transfer, Permafrost heat balance, Frozen ground chemistry, Russia

53-2285

**Map of predicted offshore permafrost distribution on the Laptev Sea shelf.**

Romanovskii, N.N., et al, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.967-972, 25 refs.

Marine geology, Bottom sediment, Subsea permafrost, Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost indicators, Permafrost forecasting, Permafrost dating, Paleoclimatology, Russia—Laptev Sea

53-2286

**Model of Quaternary permafrost evolution in the Arctic.**

Rozenbaum, G.E., Shpolianskaia, N.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.973-978, 18 refs.

Permafrost distribution, Permafrost thickness, Permafrost origin, Permafrost indicators, Permafrost dating, Permafrost forecasting, Global change, Paleoclimatology

53-2287

**Trends of permafrost development in the Selenge River basin, Mongolia.**

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost heat balance, Permafrost weathering, Permafrost forecasting, Ground thawing, Global warming, Mongolia



53-2288

**Numerical modeling of coupled moisture, solute and heat transport in frozen soils.**

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Permafrost heat transfer, Permafrost hydrology, Frozen ground thermodynamics, Frozen ground chemistry, Soil freezing, Soil water migration, Mathematical models

53-2289

**Cryostructure development on the floodplain of the Colville River Delta, northern Alaska.**

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Deltas, Floodplains, Alluvium, Permafrost surveys, Permafrost beneath rivers, Permafrost structure, Periglacial processes, Ground ice, Ice wedges, United States—Alaska—Colville River Delta

53-2290

**Sources of natural gas within permafrost, north-west Siberia.**

Skorobogatov, V.A., Iakushev, V.S., Chuvilin, E.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1001-1007, 13 refs.

Gas wells, Natural gas, Hydrates, Exploration, Permafrost surveys, Permafrost thickness, Permafrost structure, Frozen ground chemistry, Geochemistry, Russia—Yamal Peninsula, Russia—Yamburg

53-2291

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost thermal properties, Permafrost heat transfer, Active layer, Frozen ground temperature, Soil air interface, Air temperature, Degree days, Canada—Yukon Territory

53-2292

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Permafrost surveys, Permafrost distribution, Maps, Mapping, Bibliographies, Data processing, Russia

53-2293

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Permafrost hydrology, Suprapermafrost ground water, Subpermafrost ground water, Taliks, Saline soils, Frozen ground chemistry, Frozen ground temperature, Climatic changes, Russia—Yamal Peninsula

53-2294

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Periglacial processes, Slope processes, Rock glaciers, Moraines, Ground ice, Nivation, Talus, Paleoclimatology, Antarctica—James Ross Island

53-2295

**Impact of soil freezing on the continental-scale seasonal cycle simulated by a general circulation model.**

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Soil freezing, Frozen ground thermodynamics, Permafrost heat balance, Permafrost heat transfer, Permafrost hydrology, Soil air interface, Atmospheric circulation, Hydrologic cycle, Global warming, Computerized simulation

53-2296

**Effect of atmospheric temperature inversions on ground surface temperatures and discontinuous permafrost, Norman Wells, Mackenzie Valley, Canada.**

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Discontinuous permafrost, Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Permafrost forecasting, Taliks, Frozen ground temperature, Soil air interface, Surface temperature, Air temperature, Temperature inversions, Canada—Northwest Territories—Norman Wells

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Avalanche engineering, Snow stabilization, Snow retention, Snow fences, Foundations, Permafrost beneath structures, Permafrost control, Permafrost preservation, Frozen ground strength, Slope stability, Soil creep, Solifluction, Soil stabilization, Switzerland

53-2298

**Construction experience on hydraulic fill in a permafrost area.**

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Permafrost beneath structures, Permafrost hydrology, Permafrost control, Permafrost preservation, Hydraulic fill, Foundations, Frozen ground settling, Building codes, Russia—Yakutsk

53-2299

**Rock glaciers and permafrost reconstruction in the southern Carpathian Mountains, Romania.**

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**Application of pollen and spores to determine the origin and formation conditions of ground ice in western Siberia.**

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Periglacial processes, Ground ice, Ice wedges, Fossil ice, Permafrost origin, Permafrost dating, Ice dating, Palynology, Plant ecology, Paleobotany, Paleoclimatology, Russia—Yamal Peninsula, Russia—Gydan Peninsula

53-2301

**Oxygen-isotope and enzymatic activity variations in the Seyaha syngenetic ice-wedge complex of the Yamal Peninsula.**

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Periglacial processes, Ground ice, Ice wedges, Fossil ice, Permafrost origin, Permafrost dating, Ice dating, Palynology, Paleobotany, Plant physiology, Isotope analysis, Paleoclimatology, Russia—Yamal Peninsula

53-2302

**Role of the zone of contact of frozen soils with foundation materials in the formation of adfreezing strength.**

Volokhov, S.S., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1083-1087, 15 refs.

Foundations, Permafrost beneath structures, Permafrost control, Ground ice, Ice adhesion, Frozen ground strength

53-2303

**Borehole temperatures in alpine permafrost: a ten year series.**

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Periglacial processes, Rock glaciers, Permafrost indicators, Permafrost heat balance, Snow cover effect, Frozen ground temperature, Climatic changes, Permafrost forecasting, Switzerland

53-2304

**Influence of global warming on the state and geotechnical properties of permafrost.**

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Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost heat balance, Foundations, Permafrost beneath structures, Frozen ground temperature, Frozen ground strength, Global warming, Computerized simulation, Permafrost forecasting, Russia

53-2305

**Placing Colville River Delta research on the internet in a digital library format.**

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Deltas, Floodplains, Water erosion, Alluvium, Sediment transport, Permafrost surveys, Permafrost beneath rivers, Permafrost hydrology, Patterned ground, Research projects, Bibliographies, Data processing, United States—Alaska—Colville River Delta

53-2306

**Characteristics of permafrost in the Tanana Flats, interior Alaska.**

Walters, J.C., Racine, C.H., Jorgenson, M.T., MP 5288, International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1109-1114, 15 refs.

Permafrost surveys, Permafrost distribution, Permafrost hydrology, Permafrost forecasting, Ground thawing, Thermokarst development, Vegetation patterns, Vegetation factors, Forest land, Peat, Wetlands, Swamps, Paludification, United States—Alaska—Fairbanks, United States—Alaska—Tanana River

The Tanana Flats is a wetland region located on the distal slopes of an extensive alluvial fan complex built out of the Alaska Range. Vegetation in the Flats consists of a mosaic of fen, birch forest, black spruce forest, shrub, and bog. Permafrost is not present in the fen and bog areas, but it exists on the bordering forested or shrub areas 0.5 to 2 m above water level. The authors' studies show that permafrost in the Flats is relatively warm at -0.2 to -0.7°C, and that the distribution and characteristics of permafrost are related to the geobotanical conditions at a specific site. In general, permafrost is more ice rich and shows higher secondary porosity where finer-grained sediments (silt) are abundant. These are environments characterized by birch forest vegetation. Permafrost in areas of birch forest appears more susceptible to thaw and is currently showing signs of extensive degradation.

53-2307

**Study of the microstructure of frozen soils.**

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Frozen ground thermodynamics, Frozen ground strength, Frozen ground compression, Soil structure, Microstructure, Scanning electron microscopy

53-2308

**Recent geophysical investigations at a high alpine permafrost construction site in Switzerland.**

Wegmann, M., Keusen, H.R., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1119-1123, 11 refs.

Site surveys, Permafrost surveys, Permafrost thickness, Permafrost beneath structures, Permafrost control, Permafrost preservation, Frozen rock temperature, Frozen rock strength, Switzerland

53-2309

**Coastal permafrost investigations along a rapidly eroding shoreline, Tuktoyaktuk, N.W.T.**

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Permafrost surveys, Subsea permafrost, Permafrost distribution, Permafrost thickness, Permafrost heat transfer, Permafrost weathering, Ground ice, Ground thawing, Frozen ground temperature, Frozen ground settling, Shore erosion, Canada—Northwest Territories—Tuktoyaktuk

53-2310

**Massive ice associated with glaciolacustrine delta sediments, Slave Geological Province, N.W.T., Canada.**

Wolfe, S.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1133-1139, 19 refs.

Glacial geology, Glacial deposits, Glacial till, Outwash, Lacustrine deposits, Ground ice, Fossil ice, Ice dating, Thermokarst lakes, Permafrost beneath lakes, Permafrost thickness, Permafrost origin, Permafrost dating, Canada—Northwest Territories

53-2311

**Characteristics of patchy wetlands in a polar desert environment, Arctic Canada.**

Woo, M.K., Young, K.L., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1141-1146, 10 refs.

Deserts, Wetlands, Permafrost hydrology, Suprapermafrost ground water, Thermokarst lakes, Active layer, Canada—Northwest Territories—Cornwallis Island

53-2312

**Methane hydrate formation and dissociation in fine sands at temperatures near 0°C.**

Wright, J.F., Chuvilin, E.M., Dallimore, S.R., Iakushev, V.S., Nixon, F.M., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1147-1153, 12 refs.

Natural gas, Clathrates, Hydrates, Exploration, Permafrost structure, Frozen ground temperature, Frozen ground chemistry, Geochemistry

53-2313

**Model to evaluate the engineering geology on frozen ground from Xidatan to Wudaoliang along the Qinghai-Xizang Highway using GIS.**

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Highway planning, Route surveys, Permafrost surveys, Permafrost beneath roads, Permafrost distribution, Permafrost thickness, Permafrost forecasting, Permafrost control, Permafrost preservation, Frozen ground temperature, Frozen ground strength, Computerized simulation, China—Qinghai-Xizang Plateau

53-2314

**Critical and design heights of fill material in permafrost regions on National Road 214, eastern Qinghai-Xizang Plateau, China.**

Wu, Z.W., Zhu, L.N., Guo, X.M., Wang, X.Y., Fang, J.H., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1161-1164, 4 refs.

Embankments, Earth fills, Permafrost beneath roads, Permafrost control, Permafrost preservation, Permafrost thickness, Permafrost depth, Active layer, Thaw depth, Frost heave, Frost protection, Road maintenance, China—Qinghai-Xizang Plateau

53-2315

**Soil carbon losses due to increased cloudiness in a high arctic tundra watershed (western Spitsbergen).**

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Polar atmospheres, Atmospheric composition, Tundra climate, Tundra vegetation, Vegetation patterns, Plant ecology, Tundra soils, Nutrient cycle, Geochemical cycles, Soil air interface, Global warming, Norway—Spitsbergen

53-2316

**Hydrocarbon deposits and attendant anomalies of permafrost upper and lower boundaries.**

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Natural gas, Crude oil, Exploration, Permafrost surveys, Permafrost thickness, Active layer, Frozen ground chemistry, Geochemistry, Electromagnetic prospecting, Russia

53-2317

**Groundwater hydraulics of open system pingos.**

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Periglacial processes, Pingos, Frozen ground thermodynamics, Permafrost heat transfer, Permafrost hydrology, Subpermafrost ground water, Suprapermafrost ground water, Artesian water, Springs (water)

53-2318

**Experimental study of Poisson's ratio for frozen soil.**

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Loess, Frozen ground strength, Frozen ground compression, Soil creep, Soil tests, Strain tests

53-2319

**Latitudinal and altitudinal trends of seasonal soil thaw in Yakutia.**

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Permafrost heat transfer, Permafrost heat balance, Permafrost thickness, Permafrost forecasting, Active layer, Seasonal freeze thaw, Ground thawing, Thaw depth, Statistical analysis, Russia—Yakutia

53-2320

**Transient EM sounding in the study of permafrost.**

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Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost structure, Saline soils, Frozen rock temperature, Frozen ground chemistry, Unfrozen water content, Electrical logging, Electromagnetic prospecting, Russia

## 53-2321

**Geocryological map of the USSR at a scale of 1:2,500,000.**

Zaitsev, V.N., Ershov, E.D., Kondrat'eva, K.A., International Conference on Permafrost, 7th, Yellowknife, Northwest Territories, June 23-27, 1998. Proceedings. Edited by A.G. Lewkowicz and M. Allard, Sainte-Foy, Québec, Université Laval, Centre d'études nordiques, 1998, p.1201-1205, 10 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost structure, Permafrost hydrology, Hydrogeology, Maps, Mapping, Russia

## 53-2322

**Postfire alterations of carbon balance in tundra ecosystems: possible contribution to climate change.**

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Forest fires, Tundra vegetation, Tundra soils, Tundra climate, Vegetation patterns, Vegetation, Plant ecology, Soil air interface, Nutrient cycle, Geochemical cycles, Global warming, Russia—Vorkuta

## 53-2323

**Analyses of microstructure damage from the creep process in frozen soil using a scanning electron microscope.**

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Loess, Frozen ground strength, Frozen ground compression, Soil structure, Microstructure, Soil creep, Soil tests, Strain tests, Scanning electron microscopy

## 53-2324

**Adfreeze strength of model piles in frozen soil under dynamic loads.**

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Permafrost beneath structures, Permafrost control, Piles, Foundations, Pile load tests, Frozen ground strength, Frozen ground thermodynamics, Ice adhesion

## 53-2325

**Study of the relationship between the unfrozen water content of frozen soil and pressure.**

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Frozen ground strength, Frozen ground compression, Frozen ground thermodynamics, Frozen ground temperature, Soil freezing, Soil pressure, Unfrozen water content, Freezing points

## 53-2326

**Simulation of freezing and frozen soil behaviours using a radial basis function neural network.**

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Soil freezing, Frost penetration, Frost heave, Ground thawing, Thaw depth, Frozen ground thermodynamics, Frozen ground temperature, Frozen ground strength, Frozen ground compression, Computerized simulation

## 53-2327

**Effect of temperature and strain rate on the constitutive relation of frozen saturated silt.**

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Loess, Frozen ground thermodynamics, Frozen ground temperature, Frozen ground strength, Frozen ground compression, Soil creep, Stress strain diagrams, Mathematical models

## 53-2328

**Scale effects in a distributed snow water equivalence and snowmelt model for mountain basins.**

Cline, D.W., Elder, K., Bales, R.C., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1527-1536, 11 refs. For another version see 52-5552.

Snow surveys, Snow cover distribution, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting, Computerized simulation, United States—California—Sierra Nevada

## 53-2329

**Interactive multisensor snow and ice mapping system.**

Ramsay, B.H., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1537-1546, 22 refs. For another version see 52-5540.

Snow surveys, Snow cover distribution, Snow depth, Snow line, Ice surveys, Sea ice distribution, Terrain identification, Radiometry, Spaceborne photography, Sensor mapping, Image processing, Data processing, Data transmission

## 53-2330

**Local advection of sensible heat in the snowmelt landscape of arctic tundra.**

Neumann, N., Marsh, P., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1547-1560, 31 refs. For another version see 52-5538.

Forest tundra, Tundra climate, Snow heat flux, Snow hydrology, Snow melting, Snowmelt, Advection, Heat balance, Canada—Northwest Territories—Mackenzie Delta

## 53-2331

**Boreal forests and snow in climate models.**

Essery, R., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1561-1567, 31 refs.

Taiga, Forest canopy, Snow hydrology, Snow heat flux, Snow cover effect, Heat balance, Water balance, Global warming, Computerized simulation

## 53-2332

**Sensitivity of snowmelt processes to climate conditions and forest cover during rain-on-snow: a case study of the 1996 Pacific Northwest flood.**

Marks, D., Kimball, J., Tingey, D., Link, T., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1569-1587, 30 refs.

Snow hydrology, Snow heat flux, Snow water equivalent, Snowmelt, Forest canopy, Rain, Floods, Runoff forecasting, Flood forecasting, Mathematical models, Computerized simulation, United States—Oregon

## 53-2333

**Effects of climatic variability and flow regulation on ice-jam flooding of a northern delta.**

Prowse, T.D., Conly, F.M., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1589-1610, 41 refs.

Deltas, River ice, Ice breakup, Ice jams, Ice water interface, Ice cover effect, River flow, Flow control, Snowmelt, Flood forecasting, Flood control, Canada—Alberta—Peace-Athabasca Delta

## 53-2334

**Measurements and modelling of snow interception in the boreal forest.**

Hedstrom, N.R., Pomeroy, J.W., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1611-1625, 30 refs. For another version see 52-5534.

Taiga, Forest canopy, Interception, Snow hydrology, Snow accumulation, Snow water equivalent, Snow evaporation, Snowmelt, Runoff forecasting, Mathematical models

## 53-2335

**Effects of irradiance levels and spectral composition on mating strategies in the snow alga, *Chloromonas* sp.-D, from the Tughill Plateau, New York State.**

Hoham, R.W., et al, *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1627-1639, 40 refs.

Snow cover effect, Snow composition, Snow optics, Snow cover effect, Snowmelt, Albedo, Light effects, Algae, Cryobiology, Biomass, United States—New York

## 53-2336

**Application of indexed snowmelt algorithms in a northern wetland regime.**

Hamlin, L., Pietroniro, A., Prowse, T.D., Souli, R., Kouwen, N., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1641-1657, 32 refs.

Wetlands, Snow surveys, Snow cover distribution, Snow heat flux, Snow temperature, Snow hydrology, Snowmelt, Runoff forecasting, Computerized simulation, Canada—Northwest Territories—Liard River

## 53-2337

**Effects of climate change on water resources and runoff in an alpine basin.**

Seidel, K., Ehrler, C., Martinec, J., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1659-1669, 24 refs. For another version see 52-5542.

Snow cover distribution, Snow hydrology, Snow accumulation, Snow heat flux, Snowmelt, Snow water equivalent, Global warming, Water balance, Water reserves, Runoff forecasting, Computerized simulation, Switzerland

## 53-2338

**Influence of the spatial distribution of snow on basin-averaged snowmelt.**

Luce, C.H., Tarboton, D.G., Cooley, K.R., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1671-1683, 20 refs.

River basins, Watersheds, Snow cover distribution, Snowdrifts, Snow accumulation, Snow hydrology, Snow water equivalent, Snowmelt, Topographic effects, Runoff forecasting, Water balance, Computerized simulation, United States—Idaho

## 53-2339

**Annual maxima and partial duration flood series analysis by parametric and non-parametric methods.**

Adamowski, K., Liang, G.C., Patry, G.G., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1685-1699, 23 refs.

Stream flow, Floods, Flood forecasting, Mathematical models, Statistical analysis, Canada—Quebec, Canada—Ontario

## 53-2340

**Statistical model of spatially distributed snowmelt rates in a boreal forest basin.**

Metcalfe, R.A., Buttle, J.M., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1701-1722, 24 refs. For another version see 52-5537.

Taiga, Forest tundra, Forest canopy, Vegetation patterns, Vegetation factors, Snow cover distribution, Snow heat flux, Snow water equivalent, Snow hydrology, Snowmelt, Seepage, Water balance, Runoff forecasting, Statistical analysis, Canada—Manitoba

## 53-2341

**Improving snow cover mapping in forests through the use of a canopy reflectance model.**

Klein, A.G., Hall, D.K., Riggs, G.A., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1723-1744, 45 refs.

Snow surveys, Snow cover distribution, Mapping, Taiga, Forest canopy, Vegetation factors, Terrain identification, Radiometry, Spaceborne photography, Image processing, Canada—Saskatchewan—Prince Albert National Park

53-2342

**Effect of glacier wastage on the flow of the Bow River at Banff, Alberta, 1951-1993.**

Hopkinson, C., Young, G.J., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1745-1762, 35 refs. Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacier melting, Glacial rivers, Meltwater, River flow, Stream flow, Climatic changes, Runoff forecasting, Water reserves, Canada—Alberta—Banff

53-2343

**Snow ablation modelling in a mature aspen stand of the boreal forest.**

Hardy, J.P., Davis, R.E., Jordan, R., Ni, W., Woodcock, C.E., MP 5289, *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1763-1778, 38 refs.

Taiga, Forest canopy, Litter, Vegetation factors, Albedo, Snow heat flux, Snow hydrology, Snow air interface, Snow evaporation, Snow melting, Snowmelt, Computerized simulation, Canada—Saskatchewan—Prince Albert National Park

Snow ablation modelling at the stand scale must account for the variability in snow cover and the large variations of components of energy transfer at the forest floor. The authors' previous work successfully predicted snow ablation in a mature jack pine stand by using a one-dimensional snow process model and models predicting radiation below forest canopies. This work represents a second test of their basic modelling scenario by predicting snow ablation in a leafless, deciduous aspen stand and verifying the results with field data. New modifications to the snow model accounted for decreased albedo owing to radiation penetration through optically thin snowpacks. A provisional equation estimates litter fall on the snowpack, thereby reducing the areal averaged albedo. The authors showed that subcanopy radiation measurements can be used with a canopy model to estimate a branch area index for defoliated aspen as an analogue to the foliage area index used for conifers. Modelled incoming solar and long-wave radiation showed a strong correlation with measurements, with  $r^2=0.96$  and  $0.91$  for solar and long-wave radiation, respectively. Model results demonstrate that net radiation overwhelms turbulent exchanges as the most significant driving force for snowmelt in aspen forests. Predicted snow ablation in the aspen stand compared very favorably with available data on snow depth.

53-2344

**Six-year isotopic record of lake evaporation at a mine site in the Canadian subarctic: results and validation.**

Gibson, J.J., Reid, R., Spence, C., *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1779-1792, 34 refs.

Mining, Tailings, Soil pollution, Water pollution, Ponds, Lake water, Water chemistry, Hydrogeochemistry, Evaporation, Water balance, Isotope analysis, Canada—Northwest Territories—Yellowknife

53-2345

**Estimating the spatial distribution of snow water equivalence in a montane watershed.**

Elder, K., Rosenthal, W., Davis, R.E., MP 5290, *Hydrological processes*, Aug.-Sep. 1998, 12(10-11), p.1793-1808, 34 refs. For another version see 52-5524.

Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Snow hydrology, Snowmelt, Runoff forecasting, Statistical analysis, Computerized simulation, United States—California—Sierra Nevada

An approach to model distributed snow water equivalence (SWE) that merges field measurements of depth and density with remotely sensed snow-covered area (SCA) is described. In 1993, two teams conducted an intensive snow survey in the 92.8 km<sup>2</sup> Blackcap Basin of the Kings River. Snow depth was measured at 709 points and density in five snow pits and along five transects using a Federal Sampler. Sample locations were chosen to be representative of the range of elevation, slope and aspect of the basin. Regression tree models showed that net radiation, elevation and slope angle account for 60-70% of the variance in the depth measurements. Density was distributed over the basin on a 30 m grid with a multiple linear regression model that explained 70% of the observed variance as a function of the same three variables. The gridded depth estimates, combined with modelled density, produced spatially distributed estimates of SWE. An unsupervised spectral unmixing algorithm estimated snow cover fractions from Landsat-5 Thematic Mapper data acquired at the time as the snow survey. This method provides a snow cover fraction estimate for every pixel. This subpixel map was used as the best estimate for SCA and, combining it with the SWE map, allowed computation of the SWE volume. The estimated volume using the subpixel SCA map was compared with several SCA maps produced with simulations of binary SCA mapping techniques. Thresholds of 40, 50 and 60% fractional cover were used to map binary cases of full snow cover or no snow cover. The difference in basin SWE volume was up to 13% depending on the threshold used

to classify snow-covered versus snow-free areas. The percentage differences in volumes show a significant correlation to the percentage differences in SCA between the methods.

53-2346

**Environmental geomorphology.**

Panizza, M., *Developments in Earth Surface Processes*. Vol.4, Amsterdam, Netherlands, Elsevier Science B.V., 1996, 268p., Refs. p.240-262.

DLC GB406.P36 1996

Geomorphology, Engineering geology, Landslides, Shore erosion, Avalanches, Rock glaciers, Glacier surges, Environmental impact

53-2347

**Freeze concentration of solutions and washing of ice crystals.**

Shirai, Y., Sakashita, S., *Japan Patent Office. Patent*, Nov. 25, 1997, n.p., No.97299704.

Frozen liquids, Artificial nucleation, Artificial freezing, Ice crystal growth

53-2348

**Antifreeze and deicing composition and method for inhibiting accumulation of snow and ice on outdoor surfaces.**

Janke, G.A., Johnson, W.D., Jr., *World Intellectual Property Organization. Patent Cooperation Treaty. Patent*, Oct. 30, 1997, n.p., No.9740119.

Antifreezes, Chemical ice prevention

53-2349

**System concept for electro-optical imaging of sea ice from space in the visible and infrared spectra.**

Jackson, B., *IEEE Aerospace Applications Conference*, Aspen, CO, Feb. 1-8, 1997. *Proceedings*, Vol.2, Piscataway, NJ, Institute of Electrical and Electronics Engineers, 1997, p.263-284.

DLC TL3000.A1 I18a Vol.2

Ice surveys, Sea ice distribution, Icebergs, Drift, Ice detection, Ice reporting, Radar tracking, Spaceborne photography

53-2350

**Retrieval of biomass in boreal forests from multi-temporal ERS-1 and JERS-1 SAR images.**

Kurvonen, L., Pulliainen, J., Hallikainen, M., *IEEE transactions on geoscience and remote sensing*, Jan. 1999, 37(1)pt.1, p.198-205, 26 refs.

Taiga, Forest ecosystems, Vegetation patterns, Geobotanical interpretation, Terrain identification, Biomass, Spaceborne photography, Synthetic aperture radar, Finland

53-2351

**Monitoring soil moisture over the Canadian Prairies with the ERS scatterometer.**

Wagner, W., Noll, J., Borgeaud, M., Rott, H., *IEEE transactions on geoscience and remote sensing*, Jan. 1999, 37(1)pt.1, p.206-216, 21 refs.

Plains, Vegetation patterns, Meadow soils, Soil water, Water content, Moisture detection, Backscattering, Spaceborne photography, Canada

53-2352

**Bidirectional anisotropic reflectance of snow and sea ice in AVHRR Channel 1 and 2 spectral regions. Part I: theoretical analysis.**

Jin, Z.H., Simpson, J.J., *IEEE transactions on geoscience and remote sensing*, Jan. 1999, 37(1)pt.II, p.543-554, 43 refs.

Snow surveys, Ice surveys, Snow cover distribution, Snow surface, Sea ice distribution, Ice surface, Reflectivity, Radiometry, Spaceborne photography, Snow cover effect, Ice cover effect

53-2353

**Microwave transfer model differences in remote sensing of cloud liquid water at low temperatures.**

Lipton, A.E., Griffin, M.K., Ling, A.G., *IEEE transactions on geoscience and remote sensing*, Jan. 1999, 37(1)pt.II, p.620-623, 17 refs.

Supercooled clouds, Cloud physics, Unfrozen water content, Moisture detection, Microwaves, Attenuation

53-2354

**Analysis of glaciers and geomorphology on Svalbard using multitemporal ERS-1 SAR images.**

Engeset, R.V., Weydahl, D.J., *IEEE transactions on geoscience and remote sensing*, Nov. 1998, 36(6), p.1879-1887, 20 refs.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier surfaces, Snow ice interface, Snow line, Moraines, Terrain identification, Spaceborne photography, Synthetic aperture radar, Backscattering, Norway—Svalbard

53-2355

**Airborne C-band SAR measurements of wet snow-covered areas.**

Baghdadi, N., Livingstone, C.E., Bernier, M., *IEEE transactions on geoscience and remote sensing*, Nov. 1998, 36(6), p.1977-1981, 13 refs.

Snow surveys, Snow cover distribution, Wet snow, Snow water content, Terrain identification, Spaceborne photography, Synthetic aperture radar, Canada—Quebec—James Bay

53-2356

**Developments in aviation forecasting in the UK.**

Hall, B.A., *Meteorological applications*, Sep. 1998, 5(3), p.191-204, 35 refs.

Aircraft icing, Ice storms, Turbulence, Visibility, Safety, Weather forecasting, United Kingdom

53-2357

**Autonomous approach to road temperature prediction.**

Hertl, S., Schaffar, G., *Meteorological applications*, Sep. 1998, 5(3), p.227-238, 13 refs.

Road icing, Ice forecasting, Frost forecasting, Safety, Statistical analysis, Austria

53-2358

**Use of environmental SEM to study asphalt-water interactions.**

Williams, T.M., Miknis, F.P., *Journal of materials in civil engineering*, May 1998, 10(2), p.121-124, 7 refs.

Bitumens, Pavements, Freeze thaw tests, Frost action, Frost penetration, Seepage, Scanning electron microscopy

53-2359

**Asphalt concrete damage associated with extreme low temperatures.**

El Hussein, H.M., Kim, K.W., Ponniah, J., *Journal of materials in civil engineering*, Nov. 1998, 10(4), p.269-274, 6 refs.

Bituminous concretes, Concrete pavements, Low temperature tests, Thermal stresses, Cold stress, Cracking (fracturing)

53-2360

**Transposed climates for study of water supply variability on the Laurentian Great Lakes.**

Kunkel, K.E., Changnon, S.A., Croley, T.E., II, Quinn, F.H., *Climatic change*, Apr. 1998, 38(4), p.387-404, 28 refs.

Global warming, Atmospheric circulation, Lake effects, Water balance, Water reserves, Computerized simulation, Great Lakes

53-2361

**Great Lakes hydrology under transposed climates.**

Croley, T.E., II, Quinn, F.H., Kunkel, K.E., Changnon, S.A., *Climatic change*, Apr. 1998, 38(4), p.405-433, 18 refs.

Global warming, Atmospheric circulation, Lake effects, Water balance, Water reserves, Computerized simulation, Great Lakes

53-2362

Direct and interactive effects of allochthonous dissolved organic matter, inorganic nutrients, and ultraviolet radiation on an alpine littoral food web.

Vinebrooke, R.D., Leavitt, P.R., *Limnology and oceanography*, Sep. 1998, 43(6), p.1065-1081, 96 refs.

Forest ecosystems, Ecology, Littoral zone, Limnology, Lake water, Water chemistry, Suspended sediments, Ultraviolet radiation, Algae, Bacteria, Chlorophylls, Nutrient cycle, Biomass, Canada—Alberta—Banff National Park

53-2363

Development of a subsurface chlorophyll maximum at the entrance to the Gulf of Finland, Baltic Sea.

Kononen, K., et al, *Limnology and oceanography*, Sep. 1998, 43(6), p.1089-1106, 75 refs.

Marine biology, Sea water, Water temperature, Water chemistry, Algae, Plankton, Bacteria, Chlorophylls, Biomass, Finland, Gulf

53-2364

Oxygen and hydrogen isotope systematics of Lake Balkal, Siberia: implications for paleoclimate studies.

Seal, R.R., II, Shanks, W.C., III, *Limnology and oceanography*, Sep. 1998, 43(6), p.1251-1261, 45 refs.

Limnology, Lake water, Water chemistry, Isotope analysis, Water balance, Paleoclimatology, Russia—Baykal, Lake

53-2365

Predictive skill of an NWP system in the southern lower stratosphere.

Waugh, D.W., Sisson, J.M., Karoly, D.J., *Royal Meteorological Society. Quarterly journal A*, Oct. 1998, 124(551), p.2181-2200, 23 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Air temperature, Weather forecasting, Statistical analysis, Antarctica

53-2366

Extreme cold surge over the Greek peninsula.

Lagouvardos, K., Kotroni, V., Kallos, G., *Royal Meteorological Society. Quarterly journal A*, Oct. 1998, 124(551), p.2299-2327, 33 refs.

Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Synoptic meteorology, Wind (meteorology), Air temperature, Fronts (meteorology), Snowstorms, Records (extremes), Greece

53-2367

Analysis of the eyes formed in simulated tropical cyclones and polar lows.

Gray, S.L., *Royal Meteorological Society. Quarterly journal A*, Oct. 1998, 124(551), p.2357-2375, 31 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Wind velocity, Air temperature, Mathematical models

53-2368

Modelling the Asian summer monsoon rainfall and Eurasian winter/spring snow mass.

Dong, B.W., Valdes, P.J., *Royal Meteorological Society. Quarterly journal B*, Oct. 1998, 124(552), p.2567-2596, 54 refs.

Atmospheric circulation, Snowfall, Snow cover effect, Precipitation (meteorology), Computerized simulation

53-2369

Decrease of total ozone at low latitudes in the Southern Hemisphere by a combination of linear and nonlinear processes.

Teitelbaum, H., Moustaoi, M., Van Velthoven, P.F.J., Kelder, H., *Royal Meteorological Society. Quarterly journal B*, Oct. 1998, 124(552), p.2625-2644, 34 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Ozone, Antarctica, Chile, Argentina

53-2370

Radiolarian faunal provinces in surface sediments of the Greenland, Iceland and Norwegian (GIN) Seas.

Björklund, K.R., Cortese, G., Swanberg, N., Schrader, H.J., *Marine micropaleontology*, Nov. 1998, 35(1-2), p.105-140, 79 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Fossils, Paleocology, Water temperature, Paleoclimatology, Greenland Sea, Iceland Sea, Norwegian Sea

53-2371

Stability and meromixis in a water-filled mine pit.

Stevens, C.L., Lawrence, G.A., *Limnology and oceanography*, July 1998, 43(5), p.946-954, 20 refs.

Mining, Pits (excavations), Tailings, Ponds, Lake ice, Ice cover effect, Lake water, Water pollution, Water chemistry, Water temperature, Salinity, Limnology, Land reclamation, Canada—British Columbia

53-2372

Bifurcation rearrangement in cyclic water clusters: breaking and making hydrogen bonds.

Brown, M.G., Keutsch, F.N., Saykally, R.J., *Journal of chemical physics*, Dec. 8, 1998, 109(22), p.9645-9647, 25 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds

53-2373

Integral equation study of a simple point charge model of water.

Lombardero, M., Martin, C., Jorge, S., Lado, F., Lomba, E., *Journal of chemical physics*, Jan. 8, 1999, 110(2), p.1148-1153, 27 refs.

Water structure, Molecular structure, Molecular energy levels, Electric charge, Liquid phases, Mathematical models, Computerized simulation

53-2374

Problems of geocryology; collected papers. [Problemy geokriologii; sbornik dokladov]

Kamenskii, R.M., ed, Kunitskii, V.V., ed, Olov, B.A., ed, Shepelev, V.V., ed, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, 209p., In Russian with English titles and summaries. Refs. passim. Submitted to the 7th International Conference on Permafrost, Yellowknife, Northwest Territories, June 23-27, 1998. For individual papers see 53-2375 through 53-2401. For other papers from this conference see 53-2140 through 53-2327. Geocryology, Permafrost, Frozen ground temperature, Active layer, Thermal regime, Taliks, Cryogenic soils, Russia

53-2375

Non-stability of the cryolithozone thermal condition and caused processes of geological-hydrogeological environment transformation.

[Nestatsionarnost' teplovogo sostoiianiia krio-litozoni i vyzvayemye eli protsessy preobrazovaniia geologo-gidrogeologicheskoi sredy]

Balobaev, V.T., Tetel'baum, A.S., Mordovskoi, S.D., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.7-14, In Russian with English summary. 3 refs.

Geocryology, Geothermy, Hydrogeology, Permafrost hydrology, Permafrost heat transfer, Subpermafrost ground water, Thermal regime, Russia—Siberia

53-2376

Global climate warming and future temperatures in Northern America. [Global'noe poteplenie klimata i budushchie temperatury v Severnoi Amerike]

Gavrilova, M.K., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.15-21, In Russian with English summary. 4 refs.

Global warming, Climatic changes, Air temperature, Temperature effects, Global change, North America

53-2377

Response of Yakutia cryolithozone to long-term variations in climate elements. [Reaktsiia krio-litozoni IAKutii na mnogoletniuiu izmenchivost' elementov klimata]

Shender, N.I., Tetel'baum, A.S., Skachkov, I.U.B., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.22-30, In Russian with English summary. 6 refs.

Geocryology, Temperature variations, Temperature effects, Climatic changes, Global warming, Air temperature, Carbon dioxide, Frozen ground temperature, Russia—Yakutia

53-2378

Climate warming and monitoring of thermal state of soils in Central Yakutia. [Poteplenie klimata i monitoring teplovogo sostoiianiia gruntov v Tsentral'noi IAKutii]

Skriabin, P.N., Skachkov, I.U.B., Varlamov, S.P., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.31-39, In Russian with English summary. 10 refs.

Global warming, Climatic changes, Air temperature, Temperature effects, Soil temperature, Frozen ground temperature, Thaw depth, Russia—Yakutia

53-2379

Response of the thermal regime of the active layer to recent climatic changes in Yakutia. [Reaktsiia termicheskogo rezhima pochvogruntov IAKutii na sovremennye izmeneniia klimata]

Vasil'ev, I.S., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.40-45, In Russian with English summary. 2 refs.

Active layer, Thermal regime, Climatic changes, Soil temperature, Frozen ground temperature, Advection, Global warming, Air masses, Russia—Yakutia

53-2380

Calculation of paleoclimate temperatures from cryogenic texture. [Raschet paleoklimaticheskikh temperatur po krioennoi teksture]

Kazanskii, O.A., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.46-52, In Russian with English summary. 5 refs.

Paleoclimatology, Cryogenic structures, Permafrost origin, Soil freezing, Moisture transfer, Cryogenic soils, Analysis (mathematics), Stefan problem, Air temperature, Russia—Igarka River

53-2381

Dynamics of the coastal zone of the Gulf of Anadyr, Bering Sea, due to tidal activity.

[Dinamika pribrezhnoi zony Anadyrskogo zaliva Beringova moria pod vozdeistviem prilivov]

Liubomirov, A.S., *Problemy geokriologii; sbornik dokladov* (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskii, B.A. Olov and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.53-59, In Russian with English summary. 4 refs.

Shores, Shoreline modification, Coastal topographic features, Shore erosion, Ocean currents, Hydrothermal processes, Russia—Anadyr Bay

53-2382

**Ice complex and cryoplanation terraces on Big Lyakhovsky Island.** [Ledovyĭ kompleks i krioplanatsionnye terrasy ostrova Bol'shogo Lyakhovskogo]

Kunitskiĭ, V.V., Problemy geokriologii; sbornik dokladov (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskiĭ, B.A. Olovin and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.60-72, In Russian with English summary. 21 refs.

Altiplanation, Terraces, Quaternary deposits, Alassy, Cryogenic soils, Soil dating, Ice veins, Age determination, Soil profiles, Russia—Novosibirskiy Islands, Russia—Bol'shoy Lyakhovskiy Island

53-2383

**Genesis and paleogeographical conditions of massive ground ice formation in northern Yenisey.** [Genezis i paleogeograficheskie uslovia obrazovaniia massivnykh zalezheĭ podzemnogo l'da na Eniseĭskom Severe]

Karpov, E.G., Baranovskii, E.L., Problemy geokriologii; sbornik dokladov (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskiĭ, B.A. Olovin and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.73-81, In Russian with English summary. 4 refs.

Paleoclimatology, Ground ice, Age determination, Ice dating, Quaternary deposits, Ice veins, Glacier ice, Russia—Yenisey River

53-2384

**Some regularities in formation and distribution of floodplain taliks.** [Nekotorye zakonomernosti formirovaniia i rasprostraneniia poimennykh talikov]

Mikhailov, V.M., Problemy geokriologii; sbornik dokladov (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskiĭ, B.A. Olovin and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.82-87, In Russian with English summary. 6 refs.

Taliks, Floodplains, Alluvium, Rivers, Heat balance, Russia—Kolyma River

53-2385

**Latitudinal and altitudinal regularities of soil seasonal thaw in Yakutia.** [Shirotnye i vysotnye zakonomernosti sezonnogo protaivaniia gruntov v IAKutii]

Zabolotnik, S.I., Problemy geokriologii; sbornik dokladov (Problems of geocryology; collected papers). Edited by R.M. Kamenskii, V.V. Kunitskiĭ, B.A. Olovin and V.V. Shepelev, Yakutsk, Melnikov Permafrost Institute, Siberian Branch, Russian Academy of Sciences, 1998, p.88-94, In Russian with English summary. 16 refs. For English version see 53-2319.

Ground thawing, Seasonal freeze thaw, Thaw depth, Russia—Yakutia

53-2386

**Modeling of heat- and mass-transfer in ground freezing and heaving.** [Modellirovanie teplo- i masopereenosy v promerzaiushchikh puchinyistyykh gruntakh]

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Frozen ground thermodynamics, Soil freezing, Frost heave, Frozen ground mechanics, Heat transfer, Mass transfer, Computer programs, Mathematical models, Moisture transfer, Soil water migration

53-2387

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Electrical properties, Sands, Electrical resistivity, Frozen ground physics, Substrates

53-2388

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Sands, Gold, Frozen ground chemistry, Frozen fines, Permafrost mass transfer

53-2389

**Aeration zone in the cryolithosphere and its modification by developmental activities in northern areas.** [Zona aeratsii kriolitofery i ee izmeneniia pri tekhnogennom osvoenii severnykh territorii]

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Aeration, Hydrogeology, Seasonal freeze thaw, Freeze thaw cycles, Geocryology, Active layer, Soil water migration

53-2390

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53-2391

**Humidification fluctuation and dynamics of thermokarst processes in Central Yakutia.** [Izmenchivost' uvlazhnenosti Tsentral'noi IAKutii i dinamika termokarstovykh protsessov]

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53-2392

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Revegetation, Land reclamation, Tundra vegetation, Geocryology, Permafrost thermal properties, Temperature effects, Russia—Bol'shezemel'skaya Tundra

53-2393

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53-2394

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Geocryology, Agriculture, Ecology, Cryogenic soils, Permafrost preservation, Soil conservation, Regional planning, Mapping, Russia—Yakutia

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Regional planning, Urban planning, Design criteria, Economic development, Cold weather construction, Cold weather operation, Russia

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## 53-2398

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## 53-2401

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53-2440

**Frozen saline soils of the Arctic coast, their origin and properties. [Zasolennnye mryzlye porody Arkticheskogo poberezh'ia, ikh proiskhozhdenie i svoystva]**

Brushkov, A.V., Moscow, Izdatel'stvo Moskovskogo universiteta, 1998, 330p., In Russian with English table of contents. 370 refs.

Saline soils, Cryogenic soils, Frozen ground mechanics, Frozen ground chemistry, Frozen ground strength, Frozen ground thermodynamics, Electrical properties, Frozen ground settling, Loams, Shear strength, Frozen ground compression, Grain size, Mapping, Shores, Barents Sea, Russia—Chukotskiy Peninsula, Russia—Yamal Peninsula, Russia—Tazovskiy Peninsula, Russia—Yakutia, China—Tibet, North America

53-2441

**Moisture in the roofs of cold storage buildings.**

Tobiasson, W., Greatorex, A., SR 98-13, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Nov. 1998, 36p., ADA-358 258, 5 refs.

Moisture, Roofs, Air leakage, Thermal insulation, Vapor diffusion, Cold storage, Buildings, Freeze thaw cycles

The low-slope roofs of 10 cold storage buildings in the Dallas area were examined visually and thermographically from above and below. Cores were taken to verify infrared findings and 12x12-in. specimens of many of the insulations were removed for laboratory studies of their thermal properties. Insulations included fibrous glass, fiberboard, perlite, wood fiber, expanded and extruded polystyrene, isocyanurate, and phenolic. Areas of wet insulation were found in 8 of the 10 roofs. Some wetness was due to leaks caused by flaws in the roofing membranes and their flashings, but some was associated with infiltration of warm, moist outside air at roof-wall intersections without effective air seals. Of all the insulations examined, permeable fibrous glass was the most susceptible to wetting by air infiltration. Sustained one-way vapor drive, the sealing-in of moisture at the base of insulation in roofs of cold storage buildings by freezing, and the limited opportunities for drying wet insulation in such roofs provide incentives to use insulation that is very resistant to wetting. Its very low rates of moisture gain by vapor diffusion and its resistance to wetting in the presence of freeze-thaw cycles make extruded polystyrene insulation particularly appealing for use in the roofs of cold storage buildings.

## 53-2442

**International Conference on Snow Hydrology: The Integration of Physical, Chemical, and Biological Systems; abstracts.**

International Conference on Snow Hydrology: The Integration of Physical, Chemical, and Biological Systems, Brownsville, VT, Oct. 6-9, 1998, Hardy, J., ed, Albert, M., ed, Marsh, P., ed, SR 98-10, U.S. Army Cold Regions Research and Engineering Laboratory. Special report, Aug. 1998, 112p., ADA-359 332, One-page abstracts of 109 papers presented at the conference.

Snow hydrology, Snow cover, Snow composition, Snow water equivalent, Snowmelt, Snow physics, Frozen ground, Ecology, Tundra, Metamorphism (snow), Models

This report comprises the abstracts of all papers presented at a special four-day conference on snow hydrology held in Vermont, USA, Oct. 6-9, 1998. The purpose of this conference was to provide a forum for sharing new knowledge on snow-cover properties and processes, chemical processes in the seasonal snow cover, biotic interactions with the seasonal snow cover, distributed snowmelt models, and scaling problems in snow hydrology. To encourage exchange between disciplines, papers were sought that addressed the relation between processes—physical, chemical and biological—and the integration and distribution of these processes over different spatial and temporal scales.

## 53-2443

**Nonstructural ice control.**

Haehnel, R.B., SR 98-14, U.S. Army Cold Regions Research and Engineering Laboratory. Special report, Dec. 1998, 36p., ADA-358 268, Refs. p.33-36.

Explosives, Ice control, Ice jams, Icebreakers, Ice cutting, Saws, Albedo, River ice, Cost analysis, Performance, Dusting, Ice blasting, Thermal regime, United States—Wisconsin—Oconto River, United States—Kankakee River

Nonstructural ice control measures are used for reducing the frequency and severity of ice jam damages that do not rely on the use of a structure placed in the river. This report is a comprehensive review of current nonstructural ice control methods in use. Both advance measures and emergency response methods are addressed. Where possible, the effectiveness of these methods has been assessed, and cost of application has been tabulated. In terms of development, some of these are still in their infancy, while others are well advanced in terms of available guidance and field experience. Nonstructural methods can be used to extend the operating envelope of structural measures and can play a role in an ice control strategy that uses both structural and nonstructural components to provide the desired results. There is little guidance currently available to predict the reduction in ice jam potential due to application of any of these measures. Further work in this area should focus on developing governing relationships that relate ice and river properties and meteorological conditions to ice jam potential and severity.

## 53-2444

**Technical assessment of maglev system concepts; final report by the Government Maglev System Assessment Team.**

Lever, J.H., ed, SR 98-12, U.S. Army Cold Regions Research and Engineering Laboratory. Special report, Oct. 1998, 215p., ADA-358 293, Refs. p.195-197.

Railroads, Cost analysis, Cold weather performance, Performance, Transportation, Maintenance, Design, Safety

The Government Maglev System Assessment Team operated from 1991-93 as part of the National Maglev Initiative. The authors assessed the technical viability of four U.S. maglev system concepts, using the French TGV high-speed train and the German TR07 maglev system as assessment baselines. Maglev in general offers advantages that include high speed potential, excellent system control, high capacity, low energy consumption, low maintenance, modest land requirements, low operating costs, and ability to meet a variety of transportation missions. Further, the U.S. maglev concepts could provide superior performance to TR07 for similar cost or similar performance for less cost. They also could achieve both lower trip times and lower energy consumption along typical U.S. routes. These advantages result generally from the use of large-gap magnetic suspensions, more powerful linear synchronous motors and tilting vehicles. Innovative concepts for motors, guideways, suspension, and superconducting magnets all contribute to a potential for superior long-term performance of U.S. maglev systems compared with TGV and TR07.

## 53-2445

**Accounting for clouds in sea ice models.**

Makshtas, A.P., Andreas, E.L., Sviashchennikov, P.N., Timachev, V.F., CR 98-09, U.S. Army Cold Regions Research and Engineering Laboratory. Report, Dec. 1998, 32p., ADA-358 288, 51 refs. Cloud cover, Radiation balance, Sea ice, Ice models, Mathematical models, Drift stations, Air temperature, Heat flux, Ice cover thickness, Ice air interface, Arctic Basin, Antarctica—Weddell Sea

Over sea ice in winter, the clouds, the surface-layer air temperature, and the longwave radiation are closely coupled. This report uses archived data from the Russian North Pole (NP) drifting stations and recent data from Ice Station Weddell (ISW) to investigate this coupling. Both arctic and antarctic distributions of total cloud amount are U-shaped: that is, observed cloud amounts are typically either 0-2 tenths or 8-10 tenths in the polar regions. These data obey beta distributions; roughly 70 station-years of observations from the NP stations yielded fitting parameters for each winter month. Although surface-layer air temperature and total cloud amount are correlated, it is not straightforward to predict one from the other, because temperature is normally distributed while cloud amount has a U-shaped distribution. Nevertheless, the report presents a statistical algorithm that can predict total cloud amount in winter from surface-layer temperature alone and, as required, produces a distribution of cloud amounts that is U-shaped. Because sea ice models usually need cloud data to estimate incoming longwave radiation, this algorithm, may be useful for estimating cloud amounts and, thus, for computing the surface heat budget where no visual cloud observations are available but temperature is measured—from the arctic buoy network or from automatic weather stations, for example. The incoming longwave radiation in sea ice models is generally highly parameterized. The report evaluates five common parameterizations using data from NP-25 and ISW. The formula for estimating incoming longwave radiation that König-Langlo and Augstein developed using both arctic and antarctic data has the best properties but does depend nonlinearly on total cloud amount. This nonlinearity is crucial since cloud distributions are U-shaped, while common sources of cloud data tabulate only mean monthly values. The report therefore closes by using a one-dimensional sea ice model to investigate how methods of averaging cloud amounts affect predicted sea ice thickness in the context of the five longwave radiation parameterizations.

## 53-2446

**Calcium magnesium acetate at lower production cost: production of CMA deicer from biomass.**

Basu, R., et al, U.S. Federal Highway Administration. Office of Engineering Research and Development. Report, Jan. 1999, FHWA-RD-98-055, 148p., 47 refs.

Sewage disposal, Waste disposal, Biomass, Chemical ice prevention, Road icing, Artificial melting, Snow removal, Ice removal, Road maintenance, Cost analysis

## 53-2447

**Development of a method to test holdover times of deicing and anti-icing fluids in a cold room using artificially generated snow.**

Rasmussen, R.M., Knight, C., Hills, A., U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report, Jan. 1999, DOT/FAA/AR-98/74, 14p., PB99-129967.

Aircraft icing, Chemical ice prevention, Ice removal, Snow removal, Snowstorms, Safety, Artificial snow, Cold chambers, Environmental tests

## 53-2448

**Evaluation of technologies for the design of a prototype in-flight remote aircraft icing potential detection system.**

Mead, J.B., Pazmany, A., Goodberlet, M., MP 5291, U.S. Federal Aviation Administration. Office of Aviation Research, Washington, D.C. Report, Dec. 1998, DOT/FAA/AR-98/72, 55p., PB99-130262, 38 refs. Administered by the U.S. Army Cold Regions Research and Engineering Laboratory.

Aircraft icing, Ice forecasting, Ice detection, Cloud physics, Cloud droplets, Water content, Moisture detection, Radiometry, Airborne radar, Radar tracking, Lidar, Computerized simulation

This document presents the results of an investigation of remote sensing technologies applicable to the problem of remote aircraft icing potential detection. The long-term goal is to develop an aircraft mounted sensor capable of detecting dangerous levels of supercooled liquid water tens of kilometers ahead of the aircraft. Instruments capable of mapping range profiles of cloud liquid water content and mean particle size were investigated, specifically multifrequency radar and lidar (light detection and ranging). Multifrequency radar provided to be the most promising method for detecting liquid water content and parameters related to particle size. Backscattered power measurements at one, two and three frequencies were input to a neural network trained to estimate liquid water content and two sizing parameters. This investigation showed that both

two- and three-frequency radars were able to extract liquid water content and particle size parameters for various trial distributions of clouds and precipitation. Accuracy was highest for the three-frequency algorithm, especially in the estimation of liquid water content. Instruments capable of providing horizontal profiles of air temperature were also investigated, because they potentially provide a means of detecting regions of warmer air, free of supercooled drops. The technologies studied for temperatures profiling were oxygen band radiometry and a radar-acoustic sensor. Neither of these technologies was deemed promising enough to warrant further development within the current program.

## 53-2449

**Method of detecting accretion of frazil ice on water.**

Yankielun, N.E., MP 5292, U.S. Patent Office. Patent, Jan. 19, 1999, 4 col., USP-5,861,756, 18 refs.

Water intakes, Frazil ice, Ice accretion, Ice loads, Ice electrical properties, Ice dielectrics, Ice detection, Monitors, Warning systems

The spaced plates of a capacitor are immersed in water adjacent water intake grating so that water flowing toward the grating passes between and in contact with the plates; in this way frazil ice may accrete on the facing surfaces of the plates. As accretion occurs, the capacitance changes to indicate the amount of accretion of frazil ice which is detected, thereby providing an indication of the amount of accretion of frazil ice on the grating.

## 53-2450

**Durability of FRP composites.**

Dutta, P.K., MP 5293, International Conference on Fibre Reinforced Structural Plastics in Civil Engineering at Indian Institute of Technology, Madras, Dec. 18-20, 1995. Proceedings, New Delhi, Tata McGraw-Hill Publishing Company Limited, [1995], p.360-370, 22 refs.

Composite materials, Plastics, Polymers, Reinforced concretes, Concrete strength, Concrete durability, Freeze thaw tests, Low temperature tests, Frost resistance, Thermal stresses

The polymer matrix composite is the most mature of all composite technologies and is currently proving attractive as a structural material to replace metals. However, there are concerns about the durability of polymer composites, especially in extreme environment. Temperature and moisture influence its properties and life cycle. Influence of alkaline and saline environment may be detrimental. Ultraviolet rays, repetitive freezing and thawing, load cycling, and creep under sustained load are known to have degrading effects. Fire hazards and flammability issues also must be addressed. This paper reviews and summarizes these issues.

## 53-2451

**Design of fiber reinforced plastic (FRP) structural members.**

Ganga Rao, H.V.S., Lopez-Anido, R., Dutta, P.K., Trovillion, J.C., MP 5294, International Conference on Fibre Reinforced Structural Plastics in Civil Engineering at Indian Institute of Technology, Madras, Dec. 18-20, 1995. Proceedings, New Delhi, Tata McGraw-Hill Publishing Company Limited, [1995], p.481-489.

Composite materials, Plastics, Polymers, Structural analysis, Design criteria

The use of FRP structural members in civil applications requires a full understanding of the mechanical response. A general approach for characterization of structural FRP shapes was introduced. This methodology considers also different levels of analysis. This work is intended to assist structural engineering practitioners in the design of FRP structures. Within this approach, an application to design of wide-flange and box shapes was presented. In this application, the fiber architecture of existing shapes is optimized.

## 53-2452

**FRP composite grid/frame structures for reinforced concrete.**

Dutta, P.K., Bailey, D.M., MP 5295, International Conference on Fibre Reinforced Structural Plastics in Civil Engineering at Indian Institute of Technology, Madras, Dec. 18-20, 1995. Proceedings, New Delhi, Tata McGraw-Hill Publishing Company Limited, [1995], p.499-507, 6 refs.

Composite materials, Plastics, Polymers, Reinforced concretes, Concrete slabs, Concrete strength, Concrete durability, Structural analysis, Design criteria

This paper describes the use of continuous composite grid frames for applications as reinforcement for concrete. Potential applications are bridge decks, slabs, pile caps, and any other flat or curved concrete structures where the pace of construction must be fast. Alternative fiber systems and fabrication techniques are discussed. Preliminary design approach, analysis, and limited initial experimental data are presented.

53-2453

**Automated comparison of ice accretion shapes.**

Ruff, G.A., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 11p., AIAA-99-0625, 11 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Computerized simulation

53-2454

**Evaluation of three helicopter preflight deicing techniques.**

Ryerson, C.C., Gilligan, T.W., Koenig, G.G., MP 5296, Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 9p., AIAA-99-0499, 6 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Helicopters, Aircraft icing, Ice accretion, Ice loads, Artificial melting, Ice removal, Defrosting, Infrared equipment, Heating

Procedures for preflight deicing of helicopters have not been refined nor standardized. Parked helicopters are often exposed to weather, allowing freezing precipitation and snow to accumulate on airframe and blade surfaces. Unless removed, snow and ice may linger after precipitation ends, grounding aircraft for hours to days, depending upon temperature. Newer helicopters with composite blades and fuselage components are susceptible to damage from deicing operations because thermal and mechanical damage can cause delamination. In addition, glycol-based deicing fluids may cause corrosion of critical rotor head components. Therefore, there is a need to develop different ground deicing techniques for helicopters. This paper describes an experimental evaluation of the use of infrared radiation, hot water and hot air to deice helicopters before flight. The purpose of the experiment was to evaluate the effectiveness of each deicing method, and to assess the potential thermal effects of each on rotor blade composites. The authors' greatest interest was the potential for using infrared radiation as a deicing agent, a technique that has been used to deice fixed-wing aircraft, but not helicopters.

53-2455

**Cloud microphysical measurements in thunderstorm outflow regions during Allied/BAE 1997 flight trials.**

Strapp, J.W., et al, Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 10p., AIAA-99-0498, 18 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice loads, Ice detection, Ice forecasting, Thunderstorms, Cloud physics

53-2456

**Morphology of ice crystals in aircraft contrails.**

Hallett, J., Meyers, M.B., Bailey, M.P., Arnott, W.P., Strauss, B., Wendling, P., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 11p., AIAA-99-0497, 22 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Condensation trails, Condensation nuclei, Ice nuclei, Ice crystal growth, Ice crystal structure, Cloud physics

53-2457

**Meteorology surrounding the Roselawn accident.**

Sand, W.R., Biter, C.J., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 9p., AIAA-99-0496, 8 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice loads, Meteorological factors, Accidents, Safety

53-2458

**Shortcomings of the ATR-72 accident investigation and disposition of the case.**

Yeoman, K.E., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 8p., AIAA-99-0495, 17 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice loads, Accidents, Safety

53-2459

**Measurements of aircraft icing environments which include supercooled large drops.**

Cober, S.G., Isaac, G.A., Korolev, A.V., Strapp, J.W., Marcotte, D.L., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 11p., AIAA-99-0494, 23 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Particle size distribution

53-2460

**Delivery of weather information to the NRC Convair 580 during CFDE-III.**

Jordan, J.E., Marcotte, D.L., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 5p., AIAA-99-0493, 4 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice forecasting, Weather forecasting, Meteorological data, Data transmission, Radio communication, Telecommunication, Canada

53-2461

**Canadian Freezing Drizzle Experiment.**

Isaac, G.A., Cober, S.G., Korolev, A.V., Strapp, J.W., Tremblay, A., Marcotte, D.L., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 10p., AIAA-99-0492, 13 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice forecasting, Supercooled clouds, Cloud droplets, Great Lakes, Canada—Newfoundland

53-2462

**Experimental and numerical study of icing effects on the performance and controllability of a twin engine aircraft.**

Reehorst, A., Chung, J., Potapczuk, M., Choo, Y., Wright, W., Langhals, T., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 16p., AIAA-99-0374, 11 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208896.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Accidents, Safety, Wind tunnels, Computerized simulation

53-2463

**Investigation of dynamic flight maneuvers with an iced tailplane.**

Van Zante, J.F., Ratvasky, T.P., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 10p., AIAA-99-0371, 6 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208849.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests, Computerized simulation

53-2464

**NASA/FAA Tailplane Icing Program overview.**

Ratvasky, T.P., Van Zante, J.F., Riley, J.T., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 12p., AIAA-99-0370, 13 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208901.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Wind tunnels, Environmental tests, Computerized simulation

53-2465

**Ice accretion calculations for a commercial transport using the LEWICE3D, ICEGRID3D AND CMARC programs.**

Bidwell, C.S., Pinella, D., Garrison, P., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 27p., AIAA-99-0250, 15 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208895.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Computer programs, Computerized simulation

53-2466

**Summary of validation results for LEWICE 2.0.**

Wright, W.B., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 21p., AIAA-99-0249, 27 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration contractor report, NASA-CR-1998-208687.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Computer programs, Computerized simulation

53-2467

**Software development processes applied to computational icing simulation.**

Levinson, L.H., Potapczuk, M.G., Mellor, P.A., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 14p., AIAA-99-0248, 9 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208898.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Computer programs, Computerized simulation

53-2468

**Evaluation of methods to select scale velocities in icing scaling tests.**

Anderson, D.N., Ruff, G.A., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 11p., AIAA-99-0244, 13 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Wind tunnels, Environmental tests

53-2469

**Review of NASA Lewis' development plans for computational simulation of aircraft icing.**

Potapczuk, M.G., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 15p., AIAA-99-0243, 26 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999. Also published as U.S. National Aeronautics and Space Administration technical memorandum, NASA/TM-1999-208904.

Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Ice air interface, Air flow, Wind tunnels, Computer programs, Computerized simulation

53-2470

**Mixed-phase icing conditions: a survey of simulation capabilities.**

Riley, J.T., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 5p., AIAA-99-0099, 13 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Cloud physics, Cloud droplets, Ice nuclei, Ice forecasting, Wind tunnels, Computerized simulation

53-2471

**Parametric experimental study of the formation of glaze ice shapes on swept wings.**

Vargas, M., Reshotko, E., Reston, VA, American Institute of Aeronautics and Astronautics (AIAA), 1999, 29p., AIAA-99-0094, 9 refs. Presented at the AIAA 37th Aerospace Sciences Meeting and Exhibit, Reno, NV, Jan. 11-14, 1999.

Aircraft icing, Ice accretion, Glaze, Ice loads, Ice forecasting, Wind tunnels, Computerized simulation

- 53-2472**  
Effects of simulated-spanwise-ice shapes on airfoils: experimental investigation.  
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Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Computerized simulation
- 53-2473**  
Avalanche prediction for snow slabs: impossible mission? [Prévision des avalanches de plaques: mission impossible?]  
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Snow cover stability, Hoarfrost, Depth hoar, Snow slides, Avalanche formation, Avalanche triggering, Avalanche forecasting
- 53-2474**  
Armourer's brief. [Brèves du petit artificier]  
Meffre, J.F., *Neige et avalanches*, Dec. 1998, No.84, p.11-12,32, In French with English summary.  
Avalanche triggering, Explosives, Blasting, Helicopters, Safety
- 53-2475**  
What should we think about the new beacons. [Que penser des nouveaux ARVA]  
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Avalanches, Accidents, Rescue equipment, Radio beacons
- 53-2476**  
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Snow cover distribution, Snowstorms, Snowfall, Snow depth, France
- 53-2477**  
Avalanche accidents during 1997-98 in France. [Bilan des accidents d'avalanches 1997-98]  
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Avalanches, Accidents, France
- 53-2478**  
Dynamic in-situ synchrotron x-ray topographic observations of dislocations in notched ice crystals.  
Hu, X., Baker, I., Dudley, M., Applications of Synchrotron Radiation Techniques to Materials Science III, San Francisco, CA, Apr. 8-12, 1996. Materials Research Society Symposium Proceedings. Vol. 437, Pittsburgh, Materials Research Society, 1996, p.119-124, 16 refs.  
DLC TA404.2.A67 1996  
Ice crystal structure, Ice strength, Ice deformation, Crystal defects, Dislocations (materials), X ray analysis
- 53-2479**  
Two-dimensional airfoil performance degradation because of simulated freezing drizzle.  
Ashenden, R., Lindberg, W., Marwitz, J., *Journal of aircraft*, Nov.-Dec. 1998, 35(6), p.905-911, 13 refs.  
Aircraft icing, Ice accretion, Ice loads, Supercooled clouds, Cloud droplets, Ice air interface, Air flow, Wind tunnels, Environmental tests
- 53-2480**  
Certification and operation of helicopters in icing environments.  
Simpson, M.P., Render, P.M., *Journal of aircraft*, Nov.-Dec. 1998, 35(6), p.936-941, 8 refs.  
Helicopters, Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Safety, Europe, Canada
- 53-2481**  
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Condreva, K.J., *U.S. Patent Office. Patent*, Jan. 14, 1997, n.p., USP-5,594,250.  
Snow hydrology, Snow water equivalent, Snow optics, Snow survey tools, Gamma irradiation, Radiation absorption, Radiation measurement, Radiation measuring instruments
- 53-2482**  
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Sakata, M., Yamaguchi, H., Sakurai, M., *Japan Patent Office. Patent*, Dec. 10, 1996, n.p., No.96323285.  
Protective coatings, Waterproofing, Frost protection, Chemical ice prevention
- 53-2483**  
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Snowstorms, Snowfall, Avalanches, Avalanche deposits, Talus, Palynology, Paleobotany, Soil dating, Stratigraphy, Paleoclimatology, Norway
- 53-2484**  
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Wetlands, Peat, Vegetation patterns, Paleobotany, Soil dating, Paleoclimatology, Lacustrine deposits, Climatic changes, Estonia
- 53-2485**  
Middle-Holocene timberline fluctuation: influence on the genesis of podzols (spodosols), Norra Storfjället Massif, northern Sweden.  
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Forest lines, Mountain soils, Forest soils, Podsol, Soil composition, Soil formation, Soil dating, Paleoclimatology, Sweden—Norra Storfjället Massif
- 53-2486**  
'Little Ice Age' nivation activity in northeast Greenland.  
Christiansen, H.H., *Holocene*, 1998, 8(6), p.719-728, 34 refs.  
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- 53-2487**  
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53-2544

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53-2550

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tology, China—Qinghai-Xizang Plateau

53-2551

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raphies, China

53-2552

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53-2553

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53-2554

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Regional planning, China

53-2555

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veys, Spaceborne photography, Data processing,  
Regional planning

53-2556

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Avalanche engineering, Flood control, Regional plan-  
ning, China

53-2557

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53-2558

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Organizations, Laboratories, Research projects, Ice  
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53-2559

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53-2560

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Organizations, Stations, Research projects, Geocryol-  
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53-2561

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Glacier surveys, Ice shelves, Glacier oscillation, Gla-  
cier thickness, Glacier flow, Glacier ice, Ice cores,  
Ice composition, Paleoclimatology, Topographic sur-  
veys, Geodetic surveys, Mapping, Antarctica

53-2562

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Glacier surveys, Ice shelves, Glacier tongues, Gla-  
cier thickness, Glacier flow, Glacier oscillation,  
Tides, Ice water interface, Geodetic surveys, Topo-  
graphic surveys, Antarctica—Hells Gate

53-2563

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Glacier surveys, Ice shelves, Aerial surveys, Topo-  
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53-2564

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Glacier surveys, Glacier tongues, Glacier flow, Gla-  
cier thickness, Tides, Ice water interface, Topo-  
graphic surveys, Geodetic surveys, Antarctica—  
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53-2565

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Glacier surveys, Ice shelves, Glacier thickness, Gla-  
cier mass balance, Glacier ice, Sea ice, Ice water  
interface, Ice composition, Ice structure, Ice cores,  
Antarctica—Hells Gate

53-2566

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Glacier surveys, Glacier flow, Glacier mass balance,  
Glacier oscillation, Glacier surfaces, Topographic  
surveys, Geodetic surveys, Antarctica—Terra Nova  
Bay

53-2567

Ice shelf/ocean interactions at the front of Hells  
Gate Ice Shelf (Terra Nova Bay—Antarctica).

Tison, J.L., Barbante, C., Bondesan, A., Lorrain, R.,  
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Glacier surveys, Ice shelves, Glacier flow, Glacier  
mass balance, Glacier thickness, Glacier oscillation,  
Ice water interface, Antarctica—Hells Gate



53-2568

**Dynamical approach to explain ice structures and complex moraine genesis on a partially grounded ice shelf (Hells Gate Ice Shelf—Victoria Land, Antarctica).**

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53-2569

**Preliminary data of ice front fluctuation and iceberg production along Victoria Land coast (Antarctica).**

Frezzotti, M., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.39-42, 16 refs.

Glacier surveys, Glacier oscillation, Glacier flow, Ice shelves, Glacier tongues, Ice water interface, Calving, Icebergs, Antarctica—Victoria Land

53-2570

**Surface wind field of Victoria Land (Antarctica) from surveys of aeolian morphologic features.**

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Glacier surfaces, Glacier ablation, Ice air interface, Wind velocity, Wind direction, Wind erosion, Sastugi, Antarctica—Victoria Land

53-2571

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Frozen lakes, Glacial lakes, Lake water, Water temperature, Water level, Water balance, Antarctica—Terra Nova Bay Station

53-2572

**Airborne GPS assisted photogrammetry pilot project in Antarctica.**

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Geodetic surveys, Topographic surveys, Photogrammetric surveys, Aerial surveys, Mapping, Antarctica

53-2573

**Experimental tests of continuous kinematic GPS in Antarctica.**

Vittuari, L., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.57-63, 13 refs.

Research projects, Geodetic surveys, Data processing, Data transmission, Antarctica

53-2574

**Estimation of rates of snow deposition from shallow cores in northern Victoria Land (Antarctica).**

Barbolani, E., et al., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.65-70, 19 refs.

Glacier surveys, Glacier alimentation, Core samplers, Snow ice interface, Snow accumulation, Snow composition, Snow density, Antarctica—Victoria Land

53-2575

**Stratigraphic, isotopic and chemical profiles of a firn core from Drygalski Ice Tongue and of a snow pit from Aviator Glacier (Northern Victoria Land, Antarctica).**

Caprioli, R., et al., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.71-76, 21 refs.

Atmospheric composition, Air pollution, Scavenging, Snow ice interface, Firn, Glacier ice, Ice cores, Core samplers, Snow samplers, Ice composition, Snow stratigraphy, Antarctica—Drygalski Ice Tongue, Antarctica—Aviator Glacier

53-2576

**Oceanic source contribution to the snow composition, as function of elevation, at two coastal stations in the Terra Nova Bay area (Antarctica).**

Casella, F., Udisti, R., Piccardi, G., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.77-80, 6 refs.

Marine atmospheres, Atmospheric composition, Air pollution, Scavenging, Snow air interface, Snow composition, Antarctica—Terra Nova Bay

53-2577

**Oxygen isotopic study of a shallow ice-core drilled on the Strandline Glacier (northern Victoria Land, Antarctica).**

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Ice cores, Glacier ice, Ice composition, Isotope analysis, Antarctica—Terra Nova Bay

53-2578

**Soluble/insoluble speciation of light elements in polar ice as measured by PIXE and SEM-EDAX.**

Laj, P., Ghermandi, G., Maggi, V., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.85-90, 10 refs.

Glacier ice, Ice cores, Ice composition, Ice dating, Geochemical cycles, Paleoclimatology, Drill core analysis, X ray analysis, Scanning electron microscopy, Greenland

53-2579

**Density profiles in shallow firn cores, northern Victoria Land (Antarctica).**

Maggi, V., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.91-92, 5 refs.

Glacier surveys, Ice cores, Firn stratification, Glacier alimentation, Snow accumulation, Snow ice interface, Snow compression, Ice density, Antarctica—Victoria Land

53-2580

**Eemian to Last Glacial Maximum atmospheric microparticles background from the GRIP Project ice-core.**

Maggi, V., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.93-96, 6 refs.

Atmospheric composition, Ice cores, Glacier ice, Ice composition, Dust, Drill core analysis, Paleoclimatology, Global change, Greenland

53-2581

**Micropaleontological aspects of some cores from the western Ross Sea (Antarctica).**

Melis, R., Salvi, G., Dini, M., D'Onofrio, S., Pugliese, N., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.97-101, 9 refs.

Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Marine biology, Microbiology, Paleocology, Drill core analysis, Paleoclimatology, Antarctica—Ross Sea

53-2582

**Recent variations in the lead content of antarctic snow.**

Scarponi, G., Barbante, C., Turetta, C., Cescon, P., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.103-106, 21 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow samplers, Snow composition, Snow impurities, Antarctica

53-2583

**Behaviour of the West Antarctic ice sheet in the last 20,000 years: a marine geology approach.**

Taviani, M., Trincardi, F., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.107-108, 13 refs.

Research projects, Glaciation, Ice sheets, Ice shelves, Glacier melting, Marine geology, Sea level, Global warming, Paleoclimatology, Antarctica—West Antarctica, Antarctica—Ross Sea

53-2584

**Dating and 20-year detailed chemical data series of shallow firn core from Hercules Név (northern Victoria Land—Antarctica).**

Udisti, R., Barbolani, E., Becagli, S., Piccardi, G., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.109-113, 15 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Snow ice interface, Firn, Glacier ice, Ice composition, Core samplers, Ice dating, Antarctica—Victoria Land

53-2585

**Experimental methods for dynamic studies of floating ice shelves: an example from Hells Gate Ice Shelf (Victoria Land, Antarctica).**

Caneva, G., Lozej, A., Merlanti, F., Tabacco, I., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.115-117, 1 ref.

Research projects, Glacier surveys, Ice shelves, Glacier flow, Glacier oscillation, Icequakes, Seismic surveys, Antarctica—Hells Gate

53-2586

**Kinematic processing of GPS trajectories around Dome C and between Dome C and Dumont d'Urville.**

Cefalo, R., Manzoni, G., Tabacco, I.E., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.119-122, 3 refs.

Research projects, Geodetic surveys, Topographic surveys, Data processing, Data transmission, Antarctica—Charlie, Dome

53-2587

**Preliminary results of geoelectrical surveys on the Hells Gate Ice Shelf (Victoria Land, Antarctica).**

Lozej, A., Merlanti, F., Pavan, M., Tabacco, I., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.123-128, 1 ref.

Glacier surveys, Ice shelves, Ice structure, Ice electrical properties, Ice composition, Ice salinity, Electrical resistivity, Electromagnetic prospecting, Antarctica—Hells Gate

53-2588

**Preliminary results of R.E.S. surveys over the Hells Gate Ice Shelf (East Antarctica).**

Lozej, A., Merlanti, F., Pavan, M., Tabacco, I., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.129-132, 5 refs.

Glacier surveys, Ice shelves, Glacier thickness, Ice structure, Ice electrical properties, Radio echo soundings, Antarctica—Hells Gate

53-2589

**Preliminary results of refraction and reflection seismic surveys on the Hells Gate Ice Shelf (Victoria Land, Antarctica).**

Lozej, A., Merlanti, F., Pavan, M., Tabacco, I., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.133-138, 6 refs.

Glacier surveys, Ice shelves, Glacier thickness, Ice structure, Seismic surveys, Antarctica—Hells Gate

53-2590

**Thermal interaction between the Drygalski Ice Tongue and the ocean.**

Minale, M., Astarita, G., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.139-142, 6 refs. Ice shelves, Glacier tongues, Glacier heat balance, Glacier mass balance, Ice bottom surface, Ice water interface, Antarctica—Drygalski Ice Tongue

53-2591

**Mapping of geomorphology and glacial cover of the Mount Melbourne sheet (Antarctica) by means of remote sensing and field survey.**

Biasini, A., Bisci, C., Caputo, C., Dramis, F., Pugliese, F., Salvatore, M.C., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.159-162, 12 refs.

Glacier surveys, Ice sheets, Glacier surfaces, Aerial surveys, Topographic surveys, Terrain identification, Photointerpretation, Mapping, Antarctica—Melbourne, Mount

53-2592

**TM data processing for geologic mapping in the Nash Ridge area (Victoria Land—Antarctica).**

Casacchia, R., Picchiotti, A., Salvatori, R., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.163-165, 6 refs.

Geological surveys, Terrain identification, Mapping, Spaceborne photography, Image processing, Antarctica—Victoria Land

53-2593

**Acquisition of Ground Control Points (GCP's) for satellite image georeferentiation.**

Manco, D., Rossi, L., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.167-170, 4 refs. Geodetic surveys, Topographic surveys, Terrain identification, Mapping, Spaceborne photography, Image processing, Data processing, Antarctica

53-2594

**Use of stratospheric balloons of the Boomerang Project as remote-sensing platform.**

Salvini, F., Romeo, G., Biasini, A., *Terra Antarctica. Reports*, 1998, No.1, Meeting on Antarctic Glaciology and Paleoclimate, Rome, Italy, June 20-21, 1994. Proceedings. Edited by G. Orombelli, p.171-175, 5 refs.

Research projects, Balloons, Aerial surveys, Topographic surveys, Terrain identification, Mapping, Data processing, Image processing, Antarctica

53-2595

**Raman spectroscopic studies of THF clathrate hydrate.**

Tulk, C.A., Klug, D.D., Ripmeester, J.A., *Journal of physical chemistry A*, Nov. 5, 1998, 102(45), p.8734-8739, 28 refs.

Spectra, Ice spectroscopy, Clathrates, Hydrates, Latticed structures, Hydrogen bonds, Deuterium oxide ice, Molecular energy levels, Temperature effects

53-2596

**New optical technique to study aerosol phase transitions: the nucleation of ice from H<sub>2</sub>SO<sub>4</sub> aerosols.**

Koop, T., Ng, H.P., Molina, L.T., Molina, M.J., *Journal of physical chemistry A*, Nov. 5, 1998, 102(45), p.8924-8931, 40 refs.

Ice nuclei, Nucleation, Aerosols, Cooling rate, Melting points, Laboratory techniques, Thermodynamics, Cloud droplets, Polar stratospheric clouds, Phase transformations, Freezing points

53-2597

**Radical generation upon  $\gamma$ -irradiation of two amorphous and two crystalline forms of water at 77 K.**

Bednarek, J., Plonka, A., Hallbrucker, A., Mayer, E., *Journal of physical chemistry A*, Nov. 5, 1998, 102(45), p.9091-9094, 44 refs.

Cubic ice, Gamma irradiation, Electron paramagnetic resonance, Water vapor, Hydrogen bonds, Spectra, Ice physics, Ice crystals

53-2598

**Evaluation of traffic markings in cold regions.**

Lu, J.J., Barter, T., *Journal of transportation engineering*, Jan./Feb. 1998, 124(1), p.42-51, 20 refs. Highway planning, Safety, Visibility, Road maintenance, Cold weather performance, United States—Alaska

53-2599

**367 nm photochemistry of chlorine dioxide in and on amorphous ice.**

Anderson, L.D., Roberts, J.T., Grassian, V.H., *SPIE—The International Society for Optical Engineering. Proceedings*, 1998, Vol.3272, Laser techniques for surface science III. Edited by H.L. Dai and H.J. Freund, p.286-295, 35 refs.

DLC TA418.7.L3583 1998 Amorphous ice, Ice composition, Ice spectroscopy, Photochemical reactions

53-2600

**Stratospheric ozone chemistry on ice surfaces.**

Geiger, F.M., Hicks, J.M., *SPIE—The International Society for Optical Engineering. Proceedings*, 1998, Vol.3272, Laser techniques for surface science III. Edited by H.L. Dai and H.J. Freund, p.296-305, 59 refs.

DLC TA418.7.L3583 1998 Air pollution, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ice composition, Ice vapor interface, Ice nuclei, Ozone, Antarctica

53-2601

**Remedial measures connected with aquatic macrophytes in Norwegian regulated rivers and reservoirs.**

Rørslett, B., Johansen, S.W., *Regulated rivers: research & management*, July-Oct. 1996, 12(4-5), International Workshop on Remedial Strategies in Regulated Rivers. Proceedings. Lycksele, Sweden, Sep. 25-28, 1995, p.509-522, 47 refs. River flow, Flow control, Reservoirs, Plant ecology, Vegetation factors, Ice cover effect, Norway

53-2602

**Towards an ecologically based regulation practice in Finnish hydroelectric lakes.**

Hellsten, S., Marttunen, M., Palomäki, R., Riihimäki, J., Alasaarela, E., *Regulated rivers: research & management*, July-Oct. 1996, 12(4-5), International Workshop on Remedial Strategies in Regulated Rivers. Proceedings. Lycksele, Sweden, Sep. 25-28, 1995, p.535-545, 26 refs. Lakes, Reservoirs, Water level, Lake ice, Ice cover effect, Ice control, Flood control, Environmental protection, Cost analysis, Finland

53-2603

**Low temperature applications of variable conductance heat pipes.**

Shekrladze, I.G., Machavariani, E.S., Rusishvili, J.G., Machavariani, D.E., International Heat Pipe Symposium, 5th, Melbourne, Australia, Nov. 17-20, 1996. Proceedings. Heat pipe technology: theory, applications and prospects. Edited by J. Andrews, A. Akbarzadeh, and I. Sauciu, Oxford, Elsevier Science Ltd., 1997, p.344-349, 3 refs.

DLC TJ264.159 1996 Heat pipes, Ice melting, Artificial melting, Agriculture, Plant physiology, Frost protection, Temperature control

53-2604

**Experimental study of effect of vibration on ice contact melting within rectangular enclosures.**

Quan, L., Zhang, Z.Q., Faghri, M., National Heat Transfer Conference, 32nd, Baltimore, MD, Aug. 8-12, 1997. Proceedings. Vol.4: Fundamentals of bubble and droplet dynamics; phase change and two phase flow. Edited by S.G. Kandlikar, C.H. Amon, M.E. Ulucakli and J. O'Brien, New York, American Society of Mechanical Engineers, 1997, p.111-118, HTD-Vol.342, 15 refs.

DLC TJ260.N36 1997 Vol.4 Ice melting, Artificial melting, Ice removal, Ice prevention, Heat transfer, Defrosting

53-2605

**Mechanics of frozen soil for deep alluvium—a new field of frozen soil mechanics. [Shentu dongtu lixue—dongtu lixue fazhan de xin lingyu]**

Cui, G.X., *Journal of glaciology and geocryology*, June 1998, 20(2), p.97-100, In Chinese with English summary. 8 refs.

Alluvium, Permafrost beneath structures, Permafrost preservation, Foundations, Soil freezing, Artificial freezing, Soil stabilization, Frozen ground strength

53-2606

**Saline soils in Gansu Province and discussion on the three links of improving soil water. [Gansu yanzitu ji turang shuifen gailiang san huanjie tantao]**

Xu, X.Z., Zhang, L.X., Liu, Y.Z., Wang, J.C., Gu, T.X., *Journal of glaciology and geocryology*, June 1998, 20(2), p.101-107, In Chinese with English summary. 6 refs.

Saline soils, Soil composition, Soil chemistry, Soil water, Water table, Water retention, Evaporation control, Drainage, Irrigation, Soil conservation, Land reclamation, China—Gansu Province

53-2607

**Salt expansion accumulation of sulphate salty soil under freezing and thawing cycles. [Liusuan yanzitu zai duo ci dongrong xunhuan shi de yanzhang lei jia gulu]**

Chu, C.P., Li, B., Hou, Z.J., *Journal of glaciology and geocryology*, June 1998, 20(2), p.108-111, In Chinese with English summary. 3 refs.

Saline soils, Frozen ground chemistry, Frozen ground strength, Soil freezing, Frost heave, Freeze thaw tests

53-2608

**Application of the fracture mechanics of frozen soil to the calculation of stability of pile foundation uplift. [Dongtu duanlie lixue zai zhuangji dongba wending jishuan zhong de yingyong]**

Li, H.S., Liu, Z.L., Zhu, Y.L., *Journal of glaciology and geocryology*, June 1998, 20(2), p.112-115, In Chinese with English summary. 7 refs.

Soil freezing, Frost heave, Frozen ground strength, Piles, Foundations, Pile load tests, Frost resistance, Fracturing, Mathematical models

53-2609

**Calculation depth of the permafrost table under asphalt pavement. [Liqing lumian xia duonian dongtu shangxian bianhua jishuan de tantao]**

Mi, H.Z., Wu, Q.B., Ma, Z.X., *Journal of glaciology and geocryology*, June 1998, 20(2), p.116-119, In Chinese with English summary. 4 refs.

Permafrost beneath roads, Permafrost depth, Permafrost thickness, Permafrost preservation, Active layer, Frost penetration, Thaw depth, Pavements, Road maintenance, Mathematical models

- 53-2610**  
Extra-force on a structure due to thaw settlement of saturated sand. [Baoshui shaceng zhong jiegou de rongchen fujiali yanjiu]  
Zhou, G.Q., *Journal of glaciology and geocryology*, June 1998, 20(2), p.120-123, In Chinese with English summary. 10 refs.  
Sands, Ground thawing, Frozen ground settling, Thaw consolidation, Settlement (structural)
- 53-2611**  
Experimental study of the relationship between the unfrozen water content of frozen soil and pressure. [Dongtu weidong shulianliang yu yali guanxi de shiyan yanjiu]  
Zhang, L.X., Xu, X.Z., Zhang, Z.X., Deng, Y.S., *Journal of glaciology and geocryology*, June 1998, 20(2), p.124-127, In Chinese with English summary. 5 refs.  
Soil freezing, Frozen ground strength, Frozen ground compression, Unfrozen water content, Soil pressure, Freezing points
- 53-2612**  
Observation of the forming and thawing of frozen walls. [Dongjie bi xingcheng ji jiedong gully shice yanjiu]  
Yang, P., Chen, M.H., Zhang, W.M., Zhao, H.G., Yu, C.H., *Journal of glaciology and geocryology*, June 1998, 20(2), p.128-132, In Chinese with English summary. 2 refs.  
Shaft sinking, Walls, Artificial freezing, Soil freezing, Freezing rate, Soil stabilization, Frozen ground temperature, Ground thawing, Artificial thawing
- 53-2613**  
Pollen evidence of climate during the Last Glacial Maximum in eastern Tibetan Plateau. [Qingzang gaoyuan dongbu moci bingqi zhushegongqi qihou de huanfen zhengji]  
Tang, L.Y., Shen, C.M., Kong, Z.Z., Wang, F.B., Liu, K.B., *Journal of glaciology and geocryology*, June 1998, 20(2), p.133-140, In Chinese with English summary. 41 refs.  
Lacustrine deposits, Bottom sediment, Core samplers, Soil dating, Palynology, Paleobotany, Global change, Paleoclimatology, China—Qinghai-Xizang Plateau
- 53-2614**  
Quaternary palynological record and environment at the northeast margin of the Tibetan Plateau. [Qingzang gaoyuan dongbei bianyuan disiji baofen ji qi huanjing]  
Pan, A.D., *Journal of glaciology and geocryology*, June 1998, 20(2), p.141-149, In Chinese with English summary. 8 refs.  
Quaternary deposits, Stratigraphy, Palynology, Paleobotany, Global change, Paleoclimatology, China—Qinghai-Xizang Plateau
- 53-2615**  
Carbon isotope evidence of the soil organic matter for the ecological variation during late-Pleistocene in Jiuliang region, Jiangxi Province. [Jiangxi Jiuliang diqu wan gengxinshi shengtai bianqian de turang youji zhi tan tongweisu zhengji]  
Zhang, P.Z., et al., *Journal of glaciology and geocryology*, June 1998, 20(2), p.150-156, In Chinese with English summary. 32 refs.  
Quaternary deposits, Organic soils, Soil composition, Soil profiles, Carbon isotopes, Isotope analysis, Soil dating, Paleobotany, Global change, Paleoclimatology, China—Jiuliang
- 53-2616**  
Potential direct solar radiation based on GIS and glacier mass balance. [Ji yu dili xinxi xitong de taiyang zhijie fushu yu bigchuan wuzhi pingheng de guanxi]  
Ding, Y.J., Li, X., Cheng, G.D., Hoelzle, M., Haeblerli, W., *Journal of glaciology and geocryology*, June 1998, 20(2), p.157-162, In Chinese with English summary. 9 refs.  
Glacier surveys, Glacier heat balance, Glacier mass balance, Insolation, Data processing, China—Tian Shan
- 53-2617**  
Preliminary analyses of biogenic organic acids in Guliya ice core. [Guliya binxin zhong shengwu youji suan de chubu fenxi]  
Sun, J.Y., Qin, D.H., Yao, T.D., Li, Z.Q., *Journal of glaciology and geocryology*, June 1998, 20(2), p.163-166, In Chinese with English summary. 10 refs.  
Mountain glaciers, Ice cores, Glacier ice, Ice composition, Ice dating, Paleoclimatology, China—Kunlun Mountains
- 53-2618**  
Experimental study on the uniaxial compressive strength characteristics of fine grain ethanol model ice. [Xili jiujiu moxing bing danzhou yasuo qiangdu tezhen shiyan yanjiu]  
Li, Z.J., Riska, K., *Journal of glaciology and geocryology*, June 1998, 20(2), p.167-171, In Chinese with English summary. 7 refs.  
Artificial ice, Ice structure, Ice strength, Compressive properties, Strain tests
- 53-2619**  
Study on CH<sub>4</sub> fluxes from alpine wetlands at the Huashixia Permafrost Station, Tibetan Plateau. [Qingzang gaoyuan Huashixia dongtu zhan gao han shidi CH<sub>4</sub> paifang yanjiu]  
Jin, H.J., Cheng, G.D., Xu, B.Q., Nakano, T., *Journal of glaciology and geocryology*, June 1998, 20(2), p.172-174, In Chinese with English summary. 8 refs.  
Wetlands, Mountain soils, Meadow soils, Grasses, Plant ecology, Soil air interface, Nutrient cycle, Atmospheric composition, China—Qinghai-Xizang Plateau
- 53-2620**  
Study of hydrogen isotope in precipitation in west China. [Zhongguo xibu jiangshui zhong  $\delta D$  de chubu yanjiu]  
Tian, L.D., Yao, T.D., Stievenard, M., Jouzel, J., *Journal of glaciology and geocryology*, June 1998, 20(2), p.175-179, In Chinese with English summary. 18 refs.  
Atmospheric circulation, Atmospheric composition, Precipitation (meteorology), Heavy water, Climatic changes, Statistical analysis, China
- 53-2621**  
Analysis on the fractal structure features and formation mechanism of the Quaternary boulder clay in the Mt. Huangshan. [Huangshan disiji nili chenjiwu fenxing jiegou tezhen yu chengyin jizhi fenxi]  
Zhou, B.G., *Journal of glaciology and geocryology*, June 1998, 20(2), p.180-183, In Chinese with English summary. 8 refs.  
Periglacial processes, Quaternary deposits, Glacial till, Clay soils, Mudflows, Soil formation, Soil structure, Soil classification, Paleoclimatology, China—Anhui Province
- 53-2622**  
Climatic warming causes the glacier retreat in Mt. Qomolangma. [Qihou biannuan shi Zhumulangma feng diqu bingchuan chu yu tuisuo zhuanxing]  
Ren, J.W., Qin, D.H., Jing, Z.F., *Journal of glaciology and geocryology*, June 1998, 20(2), p.184-185, In Chinese with English summary. 5 refs.  
Glacier surveys, Mountain glaciers, Glacier oscillation, Glacier melting, Global warming, Himalaya Mountains
- 53-2623**  
Review of the study on the impact of snow cover in the Tibetan Plateau on Asian monsoon. [Qingzang gaoyuan xuegai dui Yazhou jifeng yingxiang yanjiu jinzhan]  
Yang, M.X., Yao, T.D., *Journal of glaciology and geocryology*, June 1998, 20(2), p.186-191, In Chinese with English summary. 34 refs.  
Snow cover distribution, Snow heat flux, Snow air interface, Snow cover effect, Atmospheric circulation, Precipitation (meteorology), China—Qinghai-Xizang Plateau
- 53-2624**  
Proceedings of the 55th annual Eastern Snow Conference, Jackson, NH, June 2-3, 1998.  
Eastern Snow Conference, Taylor, S., ed, Hardy, J.P., ed, MP 5297, *Eastern Snow Conference. Proceedings*, 1998, 55th, 173p., Refs. passim. For individual papers see 53-2625 through 53-2642.  
Snow surveys, Snow cover distribution, Snowfall, Snow accumulation, Snow hydrology, Snow air interface, Snow heat flux, Snow water equivalent, Snowmelt, Atmospheric circulation, Weather forecasting, Runoff forecasting
- 53-2625**  
Revised snow measurement guidelines for National Weather Service cooperative observers.  
Leffler, R.J., Horvitz, A., Doesken, N.J., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.1-4, 6 refs.  
Snow surveys, Snowfall, Snow depth, Snow water equivalent, Weather observations, Weather forecasting, Meteorological data
- 53-2626**  
Forecasting snowfall amounts: an ingredients-based methodology supporting the Garcia Method.  
Nietfeld, D.D., Kennedy, D.A., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.5-12, 9 refs.  
Snowstorms, Snowfall, Precipitation (meteorology), Weather forecasting, Computerized simulation, Statistical analysis, United States—Kansas
- 53-2627**  
Using rare earth elements as chemical tracers in snow studies.  
Taylor, S., Feng, X., Klaue, B., Albert, M.R., Kirchner, J., MP 5298, *Eastern Snow Conference. Proceedings*, 1998, 55th, p.13-20, 19 refs.  
Snow composition, Snow hydrology, Snow melting, Snowmelt, Snow samplers, Water chemistry, Isotopic labeling  
The authors used rare earth element (REE) tracers to study snowpack dynamics at the Sleepers River Research Watershed, Vermont. REEs are ideal tracers for snow because they have very low natural abundances in snow, are soluble in natural precipitation, and can be detected at part-per-trillion concentrations. There are 14 different REEs available to mark snow layers. These elements have not previously been used as tracers in snow, and the preliminary observations confirmed their usefulness. Fresh snow was sampled after each major storm during the winter of 1997-98, and chemical analyses of five REEs (Ce, Dy, Pr, Tm and La) show that their natural background ranges from 1 to 10 ppt (ng/L). After each storm, spike solutions of these REEs were sprayed onto the snowpack overlying a lysimeter and an adjacent test area. Snow cores were taken from the test area before the main melt event. The distributions of REEs in the snow cores clearly mark the snow layers on which the tracers were applied. Some fraction of each tracer was lost from the snowpack before the main melt, but there was no sign of bleeding throughout the snowpack. The tracers near the top of the pack are eluted out earlier than tracers near the base, and refreezing of meltwater, as it moves through subzero sections of the snowpack, may cause some of the high tracer concentrations observed at low melt rates. This work is part of a larger study aimed at understanding stable isotopic variability and snow solute chemistry in snowpacks and in snowmelt.
- 53-2628**  
Snowpack development and ablation on glaciers and alpine areas in the North Cascades, Washington.  
Pelto, M.S., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.21-26, 11 refs.  
Snow surveys, Snow accumulation, Ablation, Snow hydrology, Snow water equivalent, Glacial hydrology, Glacier alimentation, Glacier mass balance, Runoff forecasting, United States—Washington—North Cascade Range
- 53-2629**  
Outburst and rainfall-induced peak runoff events in glacierised alpine basins.  
Collins, D.N., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.27-36, 22 refs.  
Glacial hydrology, Glacial rivers, Glacial lakes, Subglacial drainage, Snow line, Snowmelt, Rain, Lake bursts, Floods, Flood forecasting, Switzerland

- 53-2630**  
Algorithm intercomparison for accuracy assessment of the MODIS snow-mapping algorithm. Klein, A.G., Hall, D.K., Seidel, K., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.37-45, 10 refs.  
Snow surveys, Snow cover distribution, Forest canopy, Vegetation patterns, Terrain identification, Sensor mapping, Radiometry, Spaceborne photography, Image processing
- 53-2631**  
Case study of the synoptic patterns influencing midwinter snowmelt across the northern Great Plains. Grundstein, A.J., Leathers, D.J., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.47-56, 24 refs.  
Snow hydrology, Snow heat flux, Snow melting, Snowmelt, Snow air interface, Atmospheric circulation, Synoptic meteorology, Computerized simulation, Runoff forecasting, Flood forecasting, United States—Great Plains
- 53-2632**  
Evaluation of snow processes for land surface modelling. Pomeroy, J.W., et al, *Eastern Snow Conference. Proceedings*, 1998, 55th, p.57-79, 82 refs.  
Snow hydrology, Snow heat flux, Snow melting, Snowmelt, Snow cover distribution, Snow water equivalent, Interception, Snow air interface, Atmospheric circulation, Mathematical models, Computerized simulation, Runoff forecasting
- 53-2633**  
Snowfall trends in the central and southern Appalachians 1963-1964 to 1992-1993. Hartley, S., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.81-90, 28 refs.  
Snowfall, Snow accumulation, Snow air interface, Weather forecasting, Climatic changes, Statistical analysis, United States—Appalachian Mountains
- 53-2634**  
Comparison of neural network and multiple regression transmission line icing models. McComber, P., De Lafontaine, J., Druze, J.A., Laflamme, J., Paradis, A., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.91-99, 11 refs.  
Power line icing, Ice accretion, Icing rate, Ice loads, Ice forecasting, Weather forecasting, Statistical analysis, Computerized simulation
- 53-2635**  
Coupled modelling of forest snow interception and sublimation. Pomeroy, J.W., Parviainen, J., Hedstrom, N., Gray, D.M., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.101-114, 37 refs.  
Taiga, Snow hydrology, Snow heat flux, Snow air interface, Interception, Snow evaporation, Snow water equivalent, Statistical analysis, Computerized simulation, Runoff forecasting
- 53-2636**  
Application of weather radar to model the snow hydrology of southern Ontario. Fassnacht, S.R., Soulis, E.D., Snelgrove, K.R., Kouwen, N., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.115-123, 16 refs.  
Snow hydrology, Snowfall, Snow accumulation, Snowmelt, Snow water equivalent, Radar tracking, Computerized simulation, Runoff forecasting, Canada—Ontario
- 53-2637**  
Connecticut snowfall distributions. Czikowsky, M.J., Castillo, R.A., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.125-129, 2 refs.  
Snowfall, Snow cover distribution, Snow accumulation, Statistical analysis, United States—Connecticut
- 53-2638**  
Local snow sampling with grade school children. Fassnacht, S.R., Soulis, E.D., Kouwen, N., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.131-136, 11 refs.  
Snow surveys, Snow samplers, Education, Canada—Ontario
- 53-2639**  
Association between spatially autocorrelated patterns of SSM/I derived prairie snow cover and atmospheric circulations. Derksen, C., Wulder, M., LeDrew, E., Goodison, B., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.137-145, 27 refs.  
Plains, Snow surveys, Snow cover distribution, Snow water equivalent, Snow air interface, Atmospheric circulation, Terrain identification, Radiometry, Spaceborne photography, Image processing, Statistical analysis
- 53-2640**  
Automated procedure for plotting snow stratigraphy. Shultz, E.F., Albert, M.R., MP 5299, *Eastern Snow Conference. Proceedings*, 1998, 55th, p.147-151, 3 refs.  
Snow surveys, Snow survey tools, Snow samplers, Snow stratigraphy, Snow morphology, Computer programs  
Because snowpack stratigraphy influences the behavior of the pack, reports of research on snow often present illustrations of stratigraphy of the snowpack. Producing snowpack profiles by traditional manual methods is costly and time consuming. This paper describes a new, easy-to-use procedure for automatically plotting snowpack stratigraphy, either from one pit or from a series of pits; employing the software SnowPit98, the authors' macro (program) and custom font for the commercially-available software, Excel97. The custom font is used to label the snow layering with the International Snow Classification symbols. This paper describes the software, provides a user guide to its use, and shows example snow stratigraphy plots that can be generated. This software should be useful to snow physicists, hydrologists and chemists and avalanche forecasters.
- 53-2641**  
Variations in snow accumulation in the southern boreal forest: preliminary analysis of 1993-1994 and 1994-1995 measurements. Davis, R.E., Metcalfe, J.R., Hardy, J.P., Goodison, B., MP 5300, *Eastern Snow Conference. Proceedings*, 1998, 55th, p.153-164, 32 refs.  
Taiga, Forest canopy, Snow surveys, Snow cover distribution, Snow accumulation, Snow hydrology, Snowmelt, Interception, Snow evaporation, Snow water equivalent, Canada—Saskatchewan  
Snow measurements were made during the 1993-94 and 1994-95 snow cover seasons in the southern study areas of the Boreal Ecosystem Atmosphere Study to examine spatial distribution and snow accumulation on the ground. Snow water equivalent (SWE) measured along snow courses in conifer stands was less than SWE measured in an open area and an aspen stand during the accumulation period, an indication of the effect of sublimation of intercepted snow. Differences increased with time to maximum accumulation. A weighted combination of snow course and undercrown measurements was used to estimate SWE for the stands. Differences in total accumulation between the two years were large; 1993-94 had significantly less snow than 1994-95. The black spruce stand had 36 mm water equivalent less than the open area in both years. The mature jack pine stand had 28 mm and 27 mm less than the open area in both years, while the young jack pine had 22 mm less the first year and 9 mm less the second. There was essentially no difference in accumulation between the open area and the snow course in the aspen stand in each of the two years.
- 53-2642**  
El Niño and North American snow cover. Brown, R.D., *Eastern Snow Conference. Proceedings*, 1998, 55th, p.165-172, 26 refs.  
Atmospheric circulation, Snow air interface, Snow cover distribution, Snowfall, Snow depth, Spaceborne photography, Statistical analysis, North America
- 53-2643**  
Probabilistic model of rain and ice depolarisation based on the experimental estimation of the atmospheric ice content. Paraboni, A., Martellucci, A., Polonio, R., SBMO/IEEE MTT-S International Microwave and Optoelectronics Conference, Natal, Brazil, Aug. 11-14, 1997. *Proceedings*, Vol.2., Piscataway, NJ, Institute of Electrical and Electronics Engineers, Inc., 1997, p.707-712, 9 refs.  
DLC TK7876.S32 1997 Vol.2  
Cloud physics, Ice crystal size, Ice electrical properties, Ice detection, Microwaves, Wave propagation, Polarization (waves), Precipitation (meteorology), Weather forecasting, Statistical analysis, Mathematical models, Italy
- 53-2644**  
Electric conductivity and temperature variations within a raised bog in Finland: implications for bog development. Puranen, R., Mäkilä, M., Säävuori, H., *Holocene*, 1999, 9(1), p.13-24, 48 refs.  
Peat, Wetlands, Swamps, Paludification, Electromagnetic prospecting, Soil temperature, Soil chemistry, Soil air interface, Atmospheric composition, Nutrient cycle, Geochemical cycles, Finland
- 53-2645**  
Environmental changes of the last three centuries indicated by siliceous microfossil records from the southwestern Baltic Sea. Andrén, E., Shimmield, G., Brand, T., *Holocene*, 1999, 9(1), p.25-38, Refs. p.37-38.  
Marine deposits, Bottom sediment, Algae, Fossils, Water pollution, Climatic changes, Baltic Sea
- 53-2646**  
1119-year tree-ring-width chronology from western Prince William Sound, southern Alaska. Barclay, D.J., Wiles, G.C., Calkin, P.E., *Holocene*, 1999, 9(1), p.79-84, 32 refs.  
Paleobotany, Plant ecology, Climatic changes, Phenology, Paleoclimatology, United States—Alaska—Prince William Sound
- 53-2647**  
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Aircraft icing, Ice accretion, Ice loads, Ice forecasting, Surface roughness, Heat transfer, Wind tunnels, Environmental tests, Image processing

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53-2662

**System implications of rain and ice depolarisation in Ka-band satellite communications.**

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Radio communication, Telecommunication, Radio waves, Wave propagation, Snow cover effect, Snow electrical properties, Norway

53-2665

**Determination of nitroaromatic, nitramine, and nitrate ester explosives in water using solid-phase extraction and gas chromatography-electron capture detection: comparison with high-performance liquid chromatography.**

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Explosives, Waste disposal, Soil pollution, Wells, Water pollution, Water chemistry, Chemical analysis, Military facilities, Environmental impact

An analytical method for nitroaromatic, nitramine, and nitrate-ester explosives and co-contaminants in water based on solid-phase extraction (SPE) and gas chromatography-electron capture detector (GC-ECD) is described. Samples are preconcentrated using cartridge or membrane SPE followed by elution with acetonitrile. Quantitative GC analyses are obtained with deactivated direct-injection port liners, short wide-bore capillary columns, and high linear carrier gas velocities. Recoveries are 90% or greater for each of the nitroaromatics and nitrate esters and greater than 70% for nitramines and amino-nitrotoluenes. Concentration estimates for well water extracts from military sites analyzed by GC-ECD and high-performance liquid chromatography (HPLC) methods show good agreement for the analytes most frequently detected. The GC provides lower method detection limits than HPLC for most analytes, but accurate calibration is more difficult. The ultraviolet detector used for HPLC has a much greater linear range than the ECD. The GC requires more care than the HPLC.

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Bridges, Piers, Concrete durability, Concrete strength, Concrete curing, Frost resistance, Ice control, Freeze thaw tests, Design criteria, Canada—Northumberland Strait

53-2668

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Concrete admixtures, Winter concreting, Concrete curing, Concrete strength, Concrete durability

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Atmospheric boundary layer, Infrared photography, Snow surface temperature, Radiometry, Brightness, Air temperature, Topographic surveys, Remote sensing, Antarctica—Coats Land

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**Radiance coefficients of ice and water clouds in the 0.4-4.0- $\mu$ m range.** Veselov, D.P., Lobanova, G.I., Popov, O.I., Fedorova, E.O., *Journal of optical technology*, Nov. 1998, 65(11), p.887-889, 9 refs. Translated from *Opticheskiy zhurnal*.

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53-2685

**HEC-RAS River Analysis System: hydraulic reference manual, Version 2.2.** Brunner, G.W., MP 5303, *U.S. Army Corps of Engineers. Hydraulic Engineering Center*, Sep. 1998, CPD-69, Var. p.(251p.), PB99-501363 (CD-ROM), 40 refs. P.11-1 through 11-8 written by S.F. Daly, CRREL.

Manuals, Computer programs, Rivers, River ice, Ice jams, Hydraulics, River flow, Bridges, Culverts, Models, Computerized simulation, Spillways

This manual describes the theory and data requirements for the hydraulic calculations performed by HEC-RAS. Equations are presented along with the assumptions used in their derivation. Discussions are provided on how to estimate model parameters, as well as guidelines on various modeling approaches. Routines for modeling ice cover and wideriver ice jams are included.

53-2686

**HEC-RAS River Analysis System: user's manual, Version 2.2.** Brunner, G.W., MP 5304, *U.S. Army Corps of Engineers. Hydraulic Engineering Center*, Sep. 1998, CPD-68, Var. p.(243p.), PB99-501363 (CD-ROM), 19 refs. P.6-68 through 6-73 written by S.F. Daly, CRREL.

Manuals, Computer programs, Data processing, Computers, Rivers, River ice, Ice jams, Hydraulics, River flow, Bridges, Culverts, Models, Streams, Spillways

This manual is a guide to using the HEC-RAS. The manual provides an introduction and overview of the modeling system, installation instructions, how to get started, simple examples, detailed descriptions of each of the major modeling components, and how to view graphical and tabular output. Instructions for entering and editing river ice data and setting tolerances for ice jam calculations are included.

53-2687

**HEC-RAS River Analysis System: applications guide, Version 2.2.** Warner, J.C., Brunner, G.W., MP 5305, *U.S. Army Corps of Engineers. Hydraulic Engineering Center*, Sep. 1998, CPD-70, Var. p.(283p.), PB99-501363 (CD-ROM), 12 refs. P.14-1 through 14-9 written by S.F. Daly, CRREL.

Manuals, Computer applications, Computer programs, Computers, Rivers, River ice, Ice cover, Ice jams, Hydraulics, River flow, Bridges, Culverts, Models, Streams, Spillways

This document contains a series of examples that demonstrate various aspects of the HEC-RAS. Each example consists of a problem statement, data requirements, general outline of solution steps, displays of key input and output screens, and discussions of important modeling aspects. Example 14 presents an ice-covered river, including ice cover and ice jam analysis.

53-2688

**Mineral resources of the Chichagof and Baranof Islands area, southeast Alaska.** Bittenbender, P.E., Still, J.C., Maas, K.M., McDonald, M.E., Jr., *U.S. Bureau of Land Management. Alaska State Office. BLM-Alaska technical report*, Feb. 1999, No.19, 222p. + 3 fold. maps, Refs. p.133-150.

Natural resources, Minerals, Geological surveys, Exploration, Mining, Geochemistry, Lithology, United States—Alaska—Baranof Island, United States—Alaska—Chichagof Island

53-2689

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53-2690

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Ocean currents, Water transport, Water temperature, Salinity, Air water interactions, Moisture transfer, Atmospheric circulation, Hydrologic cycle, Global change, Computerized simulation

53-2691

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Ocean currents, Water transport, Water temperature, Salinity, Air water interactions, Heat balance, Heat flux, Atmospheric circulation, Global change, Computerized simulation



53-2692

**Southern high-latitude ocean climate drift in a coupled model.**

Cai, W.J., Gordon, H.B., *Journal of climate*, Jan. 1999, 12(1), p.132-146, 53 refs.

Polar atmospheres, Marine atmospheres, Ocean currents, Water transport, Atmospheric circulation, Air ice water interaction, Ice models, Global change, Computerized simulation

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53-2694

**Enhanced climate change and its detection over the Rocky Mountains.**

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53-2695

**Material coordinate treatment of the sea-ice dynamics equations.**

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53-2696

**Analog light scattering experiment of hexagonal ice-like particles. Part I: experimental apparatus and test measurements.**

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53-2697

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53-2698

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53-2699

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53-2701

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Climatology, Cloud cover, Radiometry, Solar radiation, Radiance, Spectra, Tundra climate, Tundra vegetation, Vegetation patterns, Classifications, Indexes (ratios), Statistical analysis, United States—Alaska—Happy Valley, United States—Alaska—White Hills, United States—Alaska—North Slope

53-2702

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53-2703

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53-2704

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53-2705

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53-2706

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53-2707

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Ice physics, Cubic ice, Amorphous ice, Ice dielectrics, Molecular structure, Ice growth, Polarization (charge separation), Orientation, Molecular energy levels, Monomolecular films, Ice spectroscopy, Temperature effects

53-2708

**Permeability and volume changes in till due to cyclic freeze/thaw.**

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Frozen ground mechanics, Soil structure, Soil compaction, Microstructure, Volume, Permeability, Glacial till, Freeze thaw cycles, Freeze thaw tests

53-2709

**Pack ice convergence measurements by GPS-ARGOS ice beacons.**

Prinsen, S.J., Fowler, G.A., Van der Baaren, A., *Cold regions science and technology*, Oct. 1998, 28(2), p.59-72, 2 refs.

Oceanography, Sea ice distribution, Ice surveys, Radio beacons, Spaceborne photography, Pack ice, Drift, Ice navigation, Accuracy, Performance, Statistical analysis, Canada—Labrador

53-2710

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Snow physics, Snow density, Snow cover structure, Dielectric properties, Profiles, Sounding, Portable equipment, Probes, Design, Performance, Avalanche forecasting

53-2711

**Gibbs thermodynamic potential of sea ice.**

Feistel, R., Hagen, E., *Cold regions science and technology*, Oct. 1998, 28(2), p.83-142, 49 refs.

Oceanography, Sea ice, Sea water, Ice physics, Freezing points, Melting points, Thermodynamic properties, Salinity, Brines, Ice water interface, Enthalpy, Mathematical models

53-2712

**Environmental changes during the Late Glacial and Post-Glacial in the central Pyrenees (France): new charcoal analysis and archaeological data.**

Heinz, C., Barbaza, M., *Review of palaeobotany and palynology*, 1998, 104(1), p.1-17, 44 refs.

Paleobotany, Vegetation patterns, Revegetation, Carbon black, Paleoclimatology, France—Pyrenees

53-2713

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DLC HE336.C64T697 1997

Road icing, Highway planning, Safety, Accidents, Cost analysis, Statistical analysis, China—Heilongjiang Province, China—Liaoning Province

53-2714

**Field and laboratory investigation of the effect of cold in-place recycled asphalt on transverse cracking.**

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Bitumens, Pavements, Thermal stresses, Cracking (fracturing), Paving, Cold weather construction, Cold weather tests, Highway planning, Road maintenance, Cost analysis, Canada

53-2715

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Soil pollution, Waste disposal, Soil microbiology, Land reclamation, Nutrient cycle, Canada—Labrador—Saglek Bay

53-2716

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Glaciation, Glacial geology, Glacier flow, Basal sliding, Glacial hydrology, Subglacial drainage, Glacial lakes, Glacial deposits, Glacial till, Lacustrine deposits, Quaternary deposits, Soil formation, Soil dating, Geochronology, Paleoclimatology, Canada—Alberta—Lac La Biche

53-2717

**Use of propylene glycol in solution with water to prevent frozen evaporation pans during winter months.**

Lora, C.A., Arlington, University of Texas, 1998, 88p., University Microfilms order No.1390177, M.S. thesis. 21 refs.

Reservoirs, Water supply, Evaporation control, Evaporimeters, Antifreezes, Chemical ice prevention, United States—Texas—Fort Worth

53-2718

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Atmospheric composition, Air pollution, Scavenging, Ice surface, Ice vapor interface, Adsorption, Snow permeability, Vapor diffusion, Snow composition, Snow impurities

53-2719

**Spatial and temporal variations of basal conditions beneath glaciers and ice sheets inferred from radio echo-sounding measurements.**

Gades, A.M., Seattle, University of Washington, 1998, 192p., University Microfilms order No.9836169, Ph.D. thesis. Refs. p.147-158. Glacier surveys, Mountain glaciers, Ice sheets, Glacial hydrology, Subglacial drainage, Glacier beds, Bottom topography, Glacier flow, Subglacial observations, Ice electrical properties, Ice dielectrics, Electromagnetic prospecting, Radio echo soundings, United States—Alaska—Black Rapids Glacier, Antarctica—Siple Coast

53-2720

**Nearshore ice formation and sediment transport in southern Lake Michigan.**

Kempema, E.W., Seattle, University of Washington, 1998, 152p., University Microfilms order No.9836195, Ph.D. thesis. Refs. p.146-152.

Lake ice, Fast ice, Bottom ice, Frazil ice, Ice erosion, Shore erosion, Ice rafting, Sediment transport, United States—Michigan, Lake

53-2721

**ALPTRAC: High Alpine Aerosol and Snow Chemistry.**

Puxbaum, H., ed, Wagenbach, D., ed, *Atmospheric environment*, Dec. 1998, 32(23), p.3923-4088, Refs. passim. ALPTRAC is a subproject of EUROTRAC (European Study on Transport and Chemical Transformation of Pollutants in the Atmosphere). For individual papers see 53-2722 through 53-2735.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Cloud physics, Supercooled clouds, Cloud droplets, Scavenging, Snowfall, Snow composition, Snow impurities, Alps

53-2722

**Seasonal variation of SO<sub>2</sub>, HNO<sub>3</sub>, NH<sub>3</sub> and selected aerosol components at Sonnblick (3106 m a.s.l.).**

Kasper, A., Puxbaum, H., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3925-3939, 31 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Cloud physics, Cloud droplets, Precipitation (meteorology), Scavenging, Snow composition, Snow impurities, Austria

53-2723

**On-line measurements of sulfur dioxide at the 3 km level over central Europe (Sonnblick Observatory, Austria) and statistical trajectory source analysis.**

Tscherwenka, W., Seibert, P., Kasper, A., Puxbaum, H., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3941-3952, 32 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Air masses, Cloud physics, Statistical analysis, Austria

53-2724

**Transport of polluted boundary layer air from the Po Valley to high alpine sites.**

Seibert, P., et al, *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3953-3965, 19 refs.

Atmospheric circulation, Atmospheric composition, Atmospheric boundary layer, Aerosols, Air pollution, Scavenging, Snow composition, Snow impurities, Austria, Switzerland, Italy

53-2725

**Scavenging efficiency of lead and sulfate in supercooled clouds at Sonnblick, 3106 m a.s.l., Austria.**

Kasper, A., Puxbaum, H., Brantner, B., Paleczek, S., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3967-3974, 33 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Supercooled clouds, Cloud physics, Cloud droplets, Scavenging, Austria

53-2726

**Scavenging of atmospheric constituents in mixed phase clouds at the high-alpine site Jungfraujoch. Part I: basic concept and aerosol scavenging by clouds.**

Baltensperger, U., Schwikowski, M., Jost, D.T., Nyeki, S., Gäggeler, H.W., Poulida, O., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3975-3983, 55 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Cloud physics, Condensation nuclei, Cloud droplets, Scavenging, Snow composition, Snow impurities, Switzerland

53-2727

**Scavenging of atmospheric constituents in mixed phase clouds at the high-alpine site Jungfraujoch. Part II: influence of riming on the scavenging of particulate and gaseous chemical species.**

Poulida, O., Schwikowski, M., Baltensperger, U., Staehelin, J., Gäggeler, H.W., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.3985-4000, 23 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Supercooled clouds, Cloud physics, Cloud droplets, Snow crystal nuclei, Snow crystal growth, Snowfall, Scavenging, Snow composition, Snow impurities, Switzerland

53-2728

**Scavenging of atmospheric constituents in mixed phase clouds at the high-alpine site Jungfraujoch. Part III: quantification of the removal of chemical species by precipitating snow.**

Schwikowski, M., Baltensperger, U., Gäggeler, H.W., Poulida, O., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4001-4010, 23 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Supercooled clouds, Cloud physics, Cloud droplets, Snow crystal nuclei, Snow crystal growth, Snowfall, Scavenging, Snow composition, Snow impurities, Switzerland

53-2729

**Relationships of major ions in snow fall and rime at Sonnblick Observatory (SBO, 3106 m) and implications for scavenging processes in mixed clouds.**

Puxbaum, H., Tscherwenka, W., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4011-4022, 34 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Supercooled clouds, Cloud physics, Cloud droplets, Ice nuclei, Snow crystal nuclei, Snow crystal growth, Snowfall, Scavenging, Snow composition, Snow impurities, Austria

53-2730

**Automatic recorder for air/firn transfer studies of chemical aerosol species at remote glacier sites.**

Preunkert, S., Wagenbach, D., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4021-4030, 41 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Snow air interface, Scavenging, Snow composition, Snow impurities, Firn, Mountain glaciers, Ice cores, Core samplers, Ice composition, Switzerland

53-2731

**Concentration of ionic compounds in the winter-time deposition: results and trends from the Austrian Alps over 11 years (1983-1993).**

Winiwarter, W., et al, *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4031-4040, 31 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Mountain glaciers, Snow ice interface, Snow samplers, Ion density (concentration), Austria

53-2732

**Seasonal development of ion concentration in a high alpine snow pack.**

Kuhn, M., Haslhofer, J., Nickus, U., Schellander, H., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4041-4051, 21 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snowfall, Snow composition, Snow impurities, Snow samplers, Ion density (concentration), Austria

53-2733

**Major element chemistry in alpine snow along a north-south transect in the eastern Alps.**

Nickus, U., Kuhn, M., Novo, A., Rossi, G.C., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4053-4060, 22 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snowfall, Snow composition, Snow impurities, Snow samplers, Ion density (concentration), Alps

53-2734

**Four-year record (1990-94) of snow chemistry at two glacier fields in the Italian Alps (Careser, 3090 m; Colle Vincent, 4086 m).**

Novo, A., Rossi, G.C., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4061-4073, 36 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snowfall, Snow composition, Snow impurities, Mountain glaciers, Snow ice interface, Snow samplers, Italy—Alps

## 53-2735

**Stable isotope analysis for characterization of pollutants at high elevation alpine sites.**

Pichlmayer, F., Schöner, W., Seibert, P., Stichler, W., Wagenbach, D., *Atmospheric environment*, Dec. 1998, 32(23), ALPTRAC: High Alpine Aerosol and Snow Chemistry. Edited by H. Puxbaum and D. Wagenbach, p.4075-4085, 35 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Scavenging, Snow composition, Snow impurities, Snow stratigraphy, Snow samplers, Isotope analysis, Austria

## 53-2736

**Into the second century of worldwide glacier monitoring—prospects and strategies.**

Haerberli, W., ed, Hoelzle, M., ed, Suter, S., ed, *Studies and reports in hydrology*, No.56, Paris, UNESCO, 1998, 227p., Refs. passim. For individual papers see 53-2737 through 53-2749.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Climatic changes, Mapping

## 53-2737

**Periodical variations of glaciers. [Les variations périodiques des glaciers]**

Forel, F.A., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.11-33, In French. Footnotes passim. Reprinted from *Archives des sciences physiques et naturelles*, Geneva, 1895, Vol.34, p.209-229.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation

## 53-2738

**Historical evolution and operational aspects of worldwide glacier monitoring.**

Haerberli, W., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.35-51, 114 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier heat balance, Glacial meteorology, Paleoclimatology, Climatic changes, Global warming

## 53-2739

**Data management and application.**

Hoelzle, M., Trindler, M., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.53-72, 20 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Data processing, Data transmission, Computer programs

## 53-2740

**Statistical analysis of glacier mass balance data.**

Reynaud, L., Dobrovolskiĭ, S.G., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.73-83, 35 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Statistical analysis

## 53-2741

**Modelling glacier fluctuations.**

Oerlemans, J., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.85-96, 49 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier flow, Glacial meteorology, Computerized simulation

## 53-2742

**Use of remote-sensing techniques.**

Williams, R.S., Jr., Hall, D.K., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.97-111, 81 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Aerial surveys, Topographic surveys, Spaceborne photography, Radio echo soundings, Mapping

## 53-2743

**Glaciers in North America.**

Ommanney, C.S.L., Demuth, M., Meier, M.F., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.113-123, 98 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Research projects, Data processing, Mapping, Canada

## 53-2744

**Glaciers in South America.**

Casassa, G., Espizua, L.E., Francou, B., Ribstein, P., Ames, A., Alean, J., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.125-146, 126 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial hydrology, Glacial meteorology, Snow line, Meltwater, Runoff, Lake bursts, Floods, Accidents, Andes

## 53-2745

**Glaciers in Europe.**

Hagen, J.O., Zanon, G., Martínez de Pisón, E., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.147-166, 89 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial meteorology, Climatic changes

## 53-2746

**Glaciers in Africa and New Zealand.**

Hastenrath, S., Chinn, T.J.H., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.167-175, 23 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Mass balance, Climatic changes, Africa, New Zealand

## 53-2747

**Glaciers in Asia.**

Tsvetkov, D.G., Osipova, G.B., Xie, Z.C., Wang, Z.T., Ageta, Y., Baast, P., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.177-196, 80 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Mass balance, Research projects, Topographic maps, Data processing

## 53-2748

**Local glaciers surrounding the continental ice sheets.**

Weidick, A., Morris, E., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.197-207, 41 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Mass balance, Research projects, Mapping, Greenland, Antarctica

## 53-2749

**Monitoring ice sheets, ice caps and large glaciers.**

Meier, M.F., *Into the second century of worldwide glacier monitoring—prospects and strategies. Studies and reports in hydrology*, No.56. Edited by W. Haerberli, M. Hoelzle, and S. Suter, Paris, UNESCO, 1998, p.209-214, 31 refs.

DLC GB2403.2158 1998

Glacier surveys, Glacier oscillation, Mass balance, Ice sheets, Calving, Research projects, Greenland, Antarctica

## 53-2750

**Use of geosynthetics to mitigate frost heave in soils.**

Henry, K.S., MP 5306, Seattle, University of Washington, 1998, 333p., University Microfilms order No.DA99-16667, Ph.D. thesis. Refs. p.149-156. Geotextiles, Composite materials, Capillarity, Frost heave, Pavements, Freezing front, Water table, Soil water, Soil freezing, Heat flux, Frost penetration, Thermodynamics, Soil stabilization, Frost protection. A capillary barrier is a layer of coarse, porous material placed in soil above the water table to prevent unsaturated water flow across the layer. Capillary barriers reduce frost heave in soils and pavement systems when they are located between the water table and the freezing front. Due their large pore sizes, geotextiles and geocomposites are capillary barrier candidates. The objectives of this research were to determine (1) the range of soil and thermal conditions under which geosynthetic capillary barriers can reduce frost heave, and (2) geosynthetic properties required for capillary barrier performance. Based on estimates of heat flux in the field and freezing test results, capillary barriers should be beneficial in most cold regions. The frost heave of soil specimens with and without geosynthetic capillary barriers was examined through freezing tests of frost-susceptible soils. Theory, capillary rise, and water retention tests showed that moist geotextiles that contain soil fines take on and transmit water more easily than geotextiles as received from the manufacturer; this was verified by freezing tests. Moist geocomposites containing soil fines effectively cut off frost heave in highly frost-susceptible soil when the soil above the capillary barrier was 75% saturated or less, but they did not work when the soil above them was more than 80% saturated. The geocomposites consisted of combinations of two different geotextiles and two different nets, and the results were not product dependent. Filtration tests verified that the geotextiles used as filters on the geocomposite performed adequately as filters in a frost-susceptible soil.

## 53-2751

**Papers.**

International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997, Budd, W.F., ed, *Annals of glaciology*, 1998, Vol.27, 728p., Refs. passim. For individual papers see 53-2752 through 53-2866. Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Ice sheets, Ice shelves, Glacier surveys, Glacier oscillation, Glacier thickness, Glacier flow, Glacier mass balance, Glacial meteorology, Ice cores, Ice composition, Air ice water interaction, Sea ice distribution, Ice models, Climatic changes, Global warming, Paleoclimatology, Antarctica

## 53-2752

**Identifying areas of low-profile ice sheet and outcrop damming in the antarctic ice sheet by ERS-1 satellite altimetry.**

Vaughan, D.G., Bamber, J.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.1-6, 31 refs. Ice sheets, Glacier surveys, Glacier thickness, Glacier beds, Glacier flow, Glacier surfaces, Spaceborne photography, Topographic surveys, Image processing, Computerized simulation, Antarctica

## 53-2753

**Elevation changes on the East Antarctic ice sheet, 1978-93, from satellite radar altimetry: a preliminary assessment.**

Lingle, C.S., Covey, D.N., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.7-18, 34 refs. Ice sheets, Glacier surveys, Glacier thickness, Glacier oscillation, Glacier surfaces, Spaceborne photography, Height finding, Radio echo soundings, Topographic surveys, Statistical analysis, Antarctica—East Antarctica

53-2754

**Comparison of ERS satellite radar altimeter heights with GPS-derived heights on the Amery Ice Shelf, East Antarctica.**

Phillips, H.A., Allison, I., Coleman, R., Hyland, G., Morgan, P.J., Young, N.W., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.19-24, 16 refs. Ice shelves, Glacier surveys, Glacier thickness, Glacier surfaces, Spaceborne photography, Height finding, Topographic surveys, Image processing, Statistical analysis, Antarctica—Amery Ice Shelf

53-2755

**Radar interferometry detection of hinge-line migration on Rutford Ice Stream and Carlson Inlet, Antarctica.**

Rignot, E., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.25-32, 27 refs.

Glacier surveys, Ice shelves, Glacier tongues, Glacier flow, Glacier thickness, Glacier mass balance, Glacier oscillation, Ice water interface, Tides, Spaceborne photography, Radio echo soundings, Antarctica—Rutford Ice Stream, Antarctica—Carlson Inlet

53-2756

**Analysis of coastal change in Marie Byrd Land and Ellsworth Land, West Antarctica, using Landsat imagery.**

Ferrigno, J.G., Williams, R.S., Jr., Rosanova, C.E., Lucchitta, B.K., Swinbank, C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.33-40, 23 refs. Glacier surveys, Ice shelves, Glacier tongues, Glacier oscillation, Glacier thickness, Glacier flow, Calving, Spaceborne photography, Antarctica—Ellsworth Land, Antarctica—Marie Byrd Land

53-2757

**Retreat of northern margins of George VI and Wilkins Ice Shelves, Antarctic Peninsula.**

Lucchitta, B.K., Rosanova, C.E., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.41-46, 31 refs. Glacier surveys, Ice shelves, Glacier oscillation, Glacier ablation, Calving, Ice breakup, Global warming, Spaceborne photography, Antarctica—George VI Ice Shelf, Antarctica—Wilkins Ice Shelf

53-2758

**Velocities of Thwaites Glacier and smaller glaciers along the Marie Byrd Land coast, West Antarctica.**

Rosanova, C.E., Lucchitta, B.K., Ferrigno, J.G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.47-53, 28 refs.

Glacier surveys, Glacier tongues, Ice shelves, Glacier flow, Glacier oscillation, Spaceborne photography, Antarctica—Thwaites Glacier

53-2759

**Comparison between glacier ice velocities inferred from GPS and sequential satellite images.**

Frezzotti, M., Capra, A., Vittuari, L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.54-60, 23 refs.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier flow, Geodetic surveys, Spaceborne photography, Image processing, Antarctica—Terra Nova Bay

53-2760

**Detailed topography of Roosevelt Island and Siple Dome, West Antarctica.**

Scambos, T.A., Nereson, N.A., Fahnestock, M.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.61-67, 22 refs.

Glacier surveys, Ice sheets, Ice shelves, Glacier flow, Glacier oscillation, Glacier mass balance, Glacier thickness, Glacier surfaces, Topographic surveys, Spaceborne photography, Image processing, Antarctica—Roosevelt Island, Antarctica—Siple Coast

53-2761

**Near-coastal iceberg distributions in East Antarctica, 50-145°E.**

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Calving, Icebergs, Ice detection, Drift, Synthetic aperture radar, Radar tracking, Spaceborne photography, Image processing, Statistical analysis, Antarctica—East Antarctica

53-2762

**Effects of ocean warming on melting and ocean circulation under the Amery Ice Shelf, East Antarctica.**

Williams, M.J.M., Warner, R.C., Budd, W.F., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.75-80, 15 refs.

Ice shelves, Ice bottom surface, Ice water interface, Glacier mass balance, Glacier melting, Ice melting, Ocean currents, Global warming, Ice models, Computerized simulation, Antarctica—Amery Ice Shelf

53-2763

**Antarctic non-stationary signals derived from Seasat-ERS-1 altimetry comparison.**

Rémy, F., Legrésy, B., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.81-85, 23 refs.

Glacier surveys, Ice sheets, Glacier mass balance, Glacier thickness, Glacier oscillation, Glacier surfaces, Height finding, Topographic surveys, Radio echo soundings, Spaceborne photography, Image processing, Antarctica—East Antarctica

53-2764

**Climatically induced retreat and collapse of northern Larsen Ice Shelf, Antarctic Peninsula.**

Rott, H., Rack, W., Nagler, T., Skvarca, P., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.86-92, 12 refs.

Glacier surveys, Ice shelves, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacier melting, Ice breakup, Global warming, Synthetic aperture radar, Spaceborne photography, Image processing, Antarctica—Larsen Ice Shelf

53-2765

**Continued northward expansion of the Ross ice Shelf, Antarctica.**

Keys, H.J.R., Jacobs, S.S., Brigham, L.W., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.93-98, 28 refs.

Glacier surveys, Ice shelves, Glacier oscillation, Glacier flow, Glacier mass balance, Glacier thickness, Calving, Antarctica—Ross Ice Shelf

53-2766

**Circulation beneath the Filchner Ice Shelf, Antarctica, and its sensitivity to changes in the ocean environment: a case study.**

Grosfeld, K., Gerdes, R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.99-104, 26 refs.

Ice shelves, Ice bottom surface, Ice water interface, Glacier mass balance, Glacier melting, Ice melting, Sea water freezing, Ocean currents, Sea water, Salinity, Global warming, Ice models, Antarctica—Filchner Ice Shelf

53-2767

**Glaciological studies on the King George Island ice cap, South Shetland Islands, Antarctica.**

Wen, J.H., Kang, J.C., Han, J.K., Xie, Z.C., Liu, L.B., Wang, D.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.105-109, 17 refs.

Glacier surveys, Glacial meteorology, Glacier mass balance, Glacier ice, Firm stratification, Ice structure, Ice temperature, Ice composition, Antarctica—King George Island

53-2768

**Holocene deglaciation and climate history of the northern Antarctic Peninsula region: a discussion of correlations between the Southern and Northern Hemispheres.**

Hjort, C., Björck, S., Ingólfsson, Ó., Möller, P., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.110-112, 24 refs.

Glaciation, Glacial geology, Glacial deposits, Glacial meteorology, Glacier melting, Marine geology, Marine deposits, Quaternary deposits, Soil dating, Geochronology, Global change, Paleoclimatology, Antarctica—Antarctic Peninsula

53-2769

**Surface lowering of the ice ramp at Rothera Point, Antarctic Peninsula, in response to regional climate change.**

Smith, A.M., Vaughan, D.G., Doake, C.S.M., Johnson, A.C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.113-118, 22 refs.

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacier thickness, Glacier ablation, Glacier surfaces, Height finding, Topographic surveys, Climatic changes, Antarctica—Rothera Point

53-2770

**Recent fluctuations of the Dry Valleys glaciers, McMurdo Sound, Antarctica.**

Chinn, T.J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.119-124, 22 refs.

Glacier surveys, Glacier oscillation, Glacier thickness, Glacier flow, Antarctica—McMurdo Dry Valleys

53-2771

**First point measurements of ice-sheet thickness change in Antarctica.**

Hamilton, G.S., Whillans, I.M., Morgan, P.J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.125-129, 24 refs.

Glacier surveys, Ice sheets, Glacier oscillation, Glacier thickness, Glacier flow, Glacier mass balance, Geodetic surveys, Antarctica—Marie Byrd Land

## 53-2772

**Mass balance of the antarctic ice sheet at Patriot Hills.**

Casassa, G., Brecher, H.H., Cárdenas, C., Rivera, A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.130-134, 17 refs.

Glacier surveys, Ice sheets, Glacier thickness, Glacier mass balance, Radio echo soundings, Height finding, Antarctica—Patriot Hills

## 53-2773

**Variations in shear deformation rate with depth at Dome Summit South, Law Dome, East Antarctica.**

Morgan, V., Van Ommen, T.D., Elcheikh, A., Li, J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.135-139, 16 refs.

Ice sheets, Glacier thickness, Glacier mass balance, Glacier flow, Glacier friction, Glacier ice, Ice structure, Ice deformation, Ice creep, Ice cores, Boreholes, Antarctica—Law Dome

## 53-2774

**Delineation of a catchment boundary using velocity and elevation measurements.**

Price, S.F., Whillans, I.M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.140-144, 13 refs.

Glacier surveys, Ice sheets, Glacier flow, Glacier mass balance, Glacier oscillation, Glacier thickness, Height finding, Topographic surveys, Geodetic surveys, Statistical analysis, Antarctica—Marie Byrd Land

## 53-2775

**Origin and longevity of flow stripes on antarctic ice streams.**

Gudmundsson, G.H., Raymond, C.F., Bindshadler, R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.145-152, 21 refs.

Ice sheets, Glacier flow, Glacier thickness, Glacier beds, Glacier friction, Glacier surfaces, Topographic features, Mathematical models, Antarctica—West Antarctica

## 53-2776

**Modelling the antarctic and Northern Hemisphere ice-sheet changes with global climate through the glacial cycle.**

Budd, W.F., Coutts, B., Warner, R.C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.153-160, 39 refs.

Glaciation, Ice sheets, Glacier oscillation, Glacier heat balance, Glacier mass balance, Glacial meteorology, Radiation balance, Global change, Paleoclimatology, Ice age theory, Ice models, Computerized simulation

## 53-2777

**Modelling the long-term response of the antarctic ice sheet to global warming.**

Warner, R.C., Budd, W.F., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.161-168, 32 refs.

Ice sheets, Glacial meteorology, Glacier oscillation, Glacier melting, Global warming, Ice models, Computerized simulation, Antarctica

## 53-2778

**Simulations of the Northern Hemisphere through the last glacial-interglacial cycle with a vertically integrated and a three-dimensional thermomechanical ice-sheet model coupled to a climate model.**

Calov, R., Marsiat, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.169-176, 15 refs.

Ice sheets, Glaciation, Glacier oscillation, Glacial meteorology, Glacier mass balance, Glacier heat balance, Paleoclimatology, Global change, Ice age theory, Ice models, Mathematical models, Computerized simulation

## 53-2779

**Surface meltstreams on the Amery Ice Shelf, East Antarctica.**

Phillips, H.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.177-181, 11 refs.

Ice shelves, Glacier surfaces, Glacial hydrology, Glacier melting, Meltwater, Stream flow, Surface drainage, Antarctica—Amery Ice Shelf

## 53-2780

**Comparison of ice-shelf creep flow simulations with ice-front motion of Filchner-Ronne Ice Shelf, Antarctica, detected by SAR interferometry.**

Hulbe, C.L., Rignot, E., MacAyeal, D.R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.182-186, 10 refs.

Ice shelves, Glacier surveys, Glacier oscillation, Glacier flow, Glacier friction, Calving, Ice breakup, Ice creep, Ice deformation, Synthetic aperture radar, Spaceborne photography, Image processing, Computerized simulation, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf

## 53-2781

**Relative magnitudes of shear and longitudinal strain rates in the inland antarctic ice sheet, and response to increasing accumulation.**

Lingle, C.S., Troshina, E.N., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.187-193, 26 refs.

Ice sheets, Glacier oscillation, Glacier flow, Glacier friction, Glacier alimentionation, Glacier thickness, Ice creep, Ice deformation, Computerized simulation, Antarctica

## 53-2782

**Simulation of the influence of ice rheology on velocity profiles and ice-sheet mass balance.**

Wang, W.L., Warner, R.C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.194-200, 32 refs.

Ice sheets, Glacier oscillation, Glacier flow, Glacier friction, Glacier thickness, Glacier mass balance, Ice creep, Ice deformation, Ice models, Computerized simulation, Antarctica

## 53-2783

**Simulation of the antarctic ice sheet with a three-dimensional polythermal ice-sheet model, in support of the EPICA project.**

Calov, R., Savvin, A., Greve, R., Hansen, I., Hutter, K., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.201-206, 23 refs.

Ice sheets, Glacier oscillation, Glacier thickness, Glacier flow, Glacier friction, Glacier heat balance, Glacial meteorology, Ice cores, Ice temperature, Ice dating, Ice models, Paleoclimatology, Computerized simulation, Antarctica

## 53-2784

**Sensitivity of the divide position at Siple Dome, West Antarctica, to boundary forcing.**

Nereson, N.A., Hindmarsh, R.C.A., Raymond, C.F., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.207-214, 22 refs.

Ice sheets, Glacier oscillation, Glacier flow, Glacier friction, Glacier mass balance, Glacier thickness, Glacier surfaces, Glacial meteorology, Paleoclimatology, Ice models, Mathematical models, Antarctica—Siple Coast

## 53-2785

**70 years of northern Victoria Land (Antarctica) accumulation rate.**

Maggi, V., et al, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.215-219, 26 refs.

Ice sheets, Glacier oscillation, Glacier mass balance, Glacial meteorology, Glacier alimentionation, Ice cores, Core samplers, Ice composition, Ice dating, Climatic changes, Antarctica—Hercules Névé

## 53-2786

**Antarctic precipitation and its contribution to the global sea-level budget.**

Bromwich, D.H., Cullather, R.I., Van Woert, M.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.220-226, 39 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Precipitation (meteorology), Evaporation, Water retention, Water balance, Hydrologic cycle, Sea level, Weather forecasting, Statistical analysis, Antarctica

## 53-2787

**Variability of accumulation rate in the catchments of Ice Streams B, C, D and E, Antarctica.**

Venteris, E.R., Whillans, I.M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.227-230, 22 refs.

Ice sheets, Glacier oscillation, Glacier thickness, Glacier alimentionation, Glacier mass balance, Glacier flow, Snow accumulation, Ice cores, Core samplers, Statistical analysis, Antarctica—Marie Byrd Land

## 53-2788

**Large spatial variation in accumulation rate in Jutulstraumen ice stream, Dronning Maud Land, Antarctica.**

Melvold, K., Hagen, J.O., Pinglot, J.F., Gundestrup, N., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.231-238, 36 refs.

Ice sheets, Glacier surveys, Glacier oscillation, Glacier thickness, Glacier mass balance, Glacier flow, Glacier alimentionation, Snow accumulation, Ice cores, Core samplers, Statistical analysis, Antarctica—Queen Maud Land

53-2789

**Firnification and the effects of wind-packing on antarctic snow.**

Craven, M., Allison, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.239-245, 17 refs. Snow erosion, Wind erosion, Wind pressure, Snow compression, Snow density, Snow ice interface, Firn stratification, Glacier alimention, Glacier ice, Ice density, Statistical analysis, Antarctica

53-2790

**Model estimates of antarctic accumulation rates and their relationship to temperature changes.**

Smith, I.N., Budd, W.F., Reid, P., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.246-250, 22 refs.

Ice sheets, Glacier oscillation, Glacier alimention, Glacier mass balance, Snow accumulation, Atmospheric circulation, Surface temperature, Air ice water interaction, Global warming, Sea level, Computerized simulation, Antarctica

53-2791

**Contribution of snowdrift sublimation to the surface mass balance of Antarctica.**

Bintanja, R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.251-259, 36 refs.

Ice sheets, Glacial meteorology, Glacier oscillation, Glacier mass balance, Snowdrifts, Snow air interface, Snow evaporation, Statistical analysis, Antarctica—East Antarctica

53-2792

**Very high-resolution seismic definition of glacial and postglacial sediment bodies in the continental shelves of the northern Trinity Peninsula region, Antarctica.**

Canals, M., Estrada, F., Urgeles, R., GEBRAP 96/97 Team, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.260-264, 12 refs.

Seismic surveys, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Glacial geology, Glacial deposits, Geochronology, Paleoclimatology, Antarctica—Trinity Peninsula

53-2793

**Internal structure and seismic facies of the deep-water sediment drifts off northern Graham Land, Antarctic Peninsula: results from a very high-resolution survey.**

Canals, M., Urgeles, R., Estrada, F., GEBRAP 96/97 Team, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.265-267, 9 refs.

Seismic surveys, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Sediment transport, Antarctica—Graham Land

53-2794

**Geochemical study of marine sediments from the Mac. Robertson shelf, East Antarctica: initial results and palaeoenvironmental implications.**

Sedwick, P.N., Harris, P.T., Robertson, L.G., McMurtry, G.M., Cremer, M.D., Robinson, P., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.268-274, 25 refs.

Marine geology, Marine deposits, Bottom sediment, Sediment transport, Drill core analysis, Geochemistry, Soil dating, Paleocology, Paleoclimatology, Antarctica—Mac. Robertson Land

53-2795

**Late Quaternary paleoenvironment of the Ross Sea continental shelf, Antarctica.**

Nishimura, A., Nakasone, T., Hiramatsu, C., Tanahashi, M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.275-280, 15 refs.

Marine geology, Marine deposits, Bottom sediment, Glacial deposits, Glacial till, Quaternary deposits, Drill core analysis, Soil dating, Geochronology, Paleoclimatology, Antarctica—Ross Sea

53-2796

**New depositional model for ice shelves, based upon sediment cores from the Ross Sea and the Mac. Robertson shelf, Antarctica.**

Domack, E.W., Harris, P.T., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.281-284, 22 refs.

Glaciation, Ice sheets, Ice shelves, Glacier oscillation, Glacial deposits, Glacial till, Ice rafting, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Soil dating, Paleoclimatology, Antarctica—Ross Sea, Antarctica—Mac. Robertson Land

53-2797

**Identification and correlation of distal tephra layers in deep-sea sediment cores, Scotia Sea, Antarctica.**

Moreton, S.G., Smellie, J.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.285-289, 18 refs.

Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Volcanic ash, Geochemistry, Drill core analysis, Soil dating, Stratigraphy, Scotia Sea

53-2798

**Provenance, geochemistry and grain-sizes of glaciogenic sediments, including the Sirius Group, and late Cenozoic glacial history of the southern Prince Albert Mountains, Victoria Land, Antarctica.**

Passchier, S., Verbers, A.L.L.M., Van der Wateren, F.M., Vermeulen, F.J.M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.290-296, 29 refs.

Nunataks, Glaciation, Glacial geology, Glacial deposits, Glacial till, Moraines, Geochemistry, Soil dating, Stratigraphy, Geochronology, Paleoclimatology, Antarctica—Prince Albert Mountains

53-2799

**Fluctuations of the East Antarctic ice-sheet margin since the last glaciation from the stratigraphy of raised beach deposits along the Soya Coast.**

Miura, H., Moriaki, K., Maemoku, H., Hirakawa, K., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.297-301, 14 refs.

Glaciation, Ice sheets, Glacier oscillation, Marine geology, Marine deposits, Beaches, Quaternary deposits, Fossils, Stratigraphy, Sea level, Paleoclimatology, Antarctica—Lützow-Holm Bay

53-2800

**Sea-ice extent in the southern ocean during the Last Glacial Maximum: another approach to the problem.**

Burckle, L.H., Mortlock, R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.302-304, 15 refs.

Sea ice distribution, Ice conditions, Marine deposits, Bottom sediment, Fossils, Drill core analysis, Paleoclimatology

53-2801

**Changes in climate, ocean and ice-sheet conditions in the Ross embayment, Antarctica, at 6 ka.**

Steig, E.J., Hart, C.P., White, J.W.C., Cunningham, W.L., Davis, M.D., Saltzman, E.S., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.305-310, 62 refs.

Glaciation, Ice sheets, Ice shelves, Glacier oscillation, Glacial meteorology, Marine deposits, Bottom sediment, Fossils, Soil dating, Ice cores, Ice composition, Ice dating, Paleoclimatology, Antarctica—Ross Sea

53-2802

**Effect of meltwater input from the antarctic ice sheet on the thermohaline circulation.**

Mikolajewicz, U., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.311-315, 24 refs.

Ice sheets, Glacial meteorology, Glacial hydrology, Glacier melting, Meltwater, Air ice water interaction, Ocean currents, Water temperature, Salinity, Atmospheric circulation, Ice models, Ice age theory, Global change, Paleoclimatology, Antarctica

53-2803

**Freezing at the grounding line in East Antarctica: possible implications for sediment export efficiency.**

Souchez, R., Khazendar, A., Ronveaux, D., Tison, J.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.316-320, 20 refs.

Ice sheets, Ice shelves, Glacier oscillation, Glacier mass balance, Ice bottom surface, Glacier melting, Ice water interface, Sea water freezing, Ice rafting, Sediment transport, Paleoclimatology, Antarctica—Terra Nova Bay

53-2804

**Glacial isostasy and the crustal structure of Antarctica.**

Zweck, C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.321-326, 20 refs.

Ice sheets, Glaciation, Glacial geology, Glacial geology, Earth crust, Tectonics, Isostasy, Sea level, Global change, Paleoclimatology, Computerized simulation, Antarctica

53-2805

**Ice dynamics near antarctic marginal mountain ranges: implications for interpreting the glacial-geological evidence.**

Pattyn, F., Declercq, H., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.327-332, 20 refs.

Ice sheets, Glaciation, Glacial geology, Glacial meteorology, Glacier oscillation, Glacier thickness, Glacier flow, Glacier mass balance, Glacier heat balance, Global change, Paleoclimatology, Ice models, Computerized simulation, Antarctica—Queen Maud Land



## 53-2806

Deep ice-core drilling at Dome Fuji and glaciological studies in east Dronning Maud Land, Antarctica.

Watanabe, O., et al, Dome-F Deep Coring Group, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.333-337, 17 refs.

Ice cores, Ice coring drills, Drilling, Coring, Antarctica—Dome Fuji Station

## 53-2807

Preliminary investigation of palaeoclimate signals recorded in the ice core from Dome Fuji Station, east Dronning Maud Land, Antarctica.

Watanabe, O., et al, Dome-F Ice Core Research Group, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.338-342, 5 refs.

Ice sheets, Ice cores, Ice composition, Glacial meteorology, Ice dating, Paleoclimatology, Antarctica—Dome Fuji Station

## 53-2808

Crystal-size and microparticle record in the ice core from Dome Summit South, Law Dome, East Antarctica.

Li, J., Jacka, T.H., Morgan, V., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.343-348, 20 refs.

Ice sheets, Ice cores, Ice composition, Dust, Impurities, Ice crystal size, Glacial meteorology, Ice dating, Paleoclimatology, Antarctica—Law Dome

## 53-2809

Lead isotopes and selected metals in ice from Law Dome, Antarctica.

Rosman, K.J.R., et al, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.349-354, 26 refs.

Ice sheets, Ice cores, Ice composition, Impurities, Dust, Isotope analysis, Ice dating, Glacial meteorology, Paleoclimatology, Antarctica—Law Dome

## 53-2810

Atmospheric dust concentration record from the Hercules N  ve firn core, northern Victoria Land, Antarctica.

Maggi, V., Petit, J.R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.355-359, 19 refs.

Ice cores, Core samplers, Air pollution, Dust, Ice composition, Climatic changes, Antarctica—Hercules N  ve

## 53-2811

Internal radio-echo layering at Vostok Station, Antarctica, as an independent stratigraphic control on the ice-core record.

Siebert, M.J., Hodgkins, R., Dowdeswell, J.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.360-364, 12 refs.

Ice sheets, Radio echo soundings, Glacier thickness, Ice electrical properties, Ice cores, Ice composition, Volcanic ash, Firn stratification, Ice dating, Drill core analysis, Antarctica—Vostok Station

## 53-2812

Iron in ice cores from Law Dome, East Antarctica: implications for past deposition of aerosol iron.

Edwards, R., Sedwick, P.N., Morgan, V., Boutron, C.F., Hong, S., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.365-370, 26 refs.

Ice sheets, Ice cores, Atmospheric composition, Aerosols, Glacial meteorology, Ice composition, Dust, Impurities, Geochemical cycles, Ice dating, Paleoclimatology, Antarctica—Law Dome

## 53-2813

Limited migration of soluble ionic species in a Siple Dome, Antarctica, ice core.

Kreutz, K.J., Mayewski, P.A., Whitlow, S.I., Twickler, M.S., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.371-377, 33 refs.

Ice cores, Core samplers, Glacial meteorology, Atmospheric composition, Air pollution, Ice composition, Impurities, Ion diffusion, Geochemical cycles, Paleoclimatology, Antarctica—Siple Coast

## 53-2814

Spatial variability of snow chemistry in western Dronning Maud Land, Antarctica.

Stenberg, M., et al, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.378-384, 28 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Geochemical cycles, Snow composition, Snow impurities, Snow samplers, Core samplers, Antarctica—Queen Maud Land

## 53-2815

Seasonal characteristics of the major ions in the high-accumulation Dome Summit South ice core, Law Dome, Antarctica.

Curran, M.A.J., Van Ommen, T.D., Morgan, V., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.385-390, 30 refs.

Ice sheets, Ice cores, Core samplers, Polar atmospheres, Marine atmospheres, Atmospheric composition, Aerosols, Air pollution, Geochemical cycles, Ice composition, Impurities, Ion density (concentration), Paleoclimatology, Antarctica—Law Dome

## 53-2816

Preliminary evidence of a biomass-burning event from a 60 year-old firn core from Antarctica by ion chromatographic determination of carboxylic acids.

Udisti, R., Becagli, S., Traversi, R., Vernigli, S., Piccardi, G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.391-397, 27 refs.

Forest fires, Air pollution, Atmospheric composition, Dust, Scavenging, Snow composition, Snow impurities, Ice cores, Core samplers, Ice dating, Paleoclimatology, Antarctica—Hercules N  ve

## 53-2817

Implications for the interpretation of ice-core isotope data from analysis of modelled antarctic precipitation.

Noone, D., Simmonds, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.398-402, 20 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Precipitation (meteorology), Ice cores, Ice composition, Isotope analysis, Paleoclimatology, Computerized simulation, Antarctica

## 53-2818

Interannual variations and regionality of antarctic sea-ice-temperature associations.

Carleton, A.M., John, G., Welsch, R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.403-408, 34 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air ice water interaction, Sea ice distribution, Ice conditions, Ice cover effect, Surface temperature, Statistical analysis, Antarctica

## 53-2819

Relationships between antarctic sea-ice concentration, wind stress and temperature temporal variability, and their changes with distance from the coast.

Watkins, A.B., Simmonds, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.409-412, 7 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Sea ice distribution, Ice conditions, Ice cover effect, Wind pressure, Surface temperature, Air ice water interaction, Statistical analysis, Antarctica

## 53-2820

Modelling global warming and antarctic sea-ice changes over the past century.

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Polar atmospheres, Marine atmospheres, Atmospheric circulation, Sea ice distribution, Ice cover thickness, Ice conditions, Ice heat flux, Air ice water interaction, Global warming, Ice models, Computerized simulation, Antarctica

## 53-2821

Distribution and formative processes of latent-heat polynyas in East Antarctica.

Massom, R.A., Harris, P.T., Michael, K.J., Potter, M.J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.420-426, 45 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice heat flux, Air ice water interaction, Polynyas, Wind factors, Radiometry, Spaceborne photography, Antarctica—East Antarctica

## 53-2822

East Antarctic sea ice: observations and modelling.

Worby, A.P., Wu, X.R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.427-432, 24 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Air ice water interaction, Ice models, Computerized simulation, Antarctica—East Antarctica

## 53-2823

Enhanced thermodynamic ice growth by sea-ice deformation.

Heil, P., Lytle, V.I., Allison, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.433-437, 20 refs.

Sea ice distribution, Sea water freezing, Ice formation, Ice growth, Ice heat flux, Drift, Ice friction, Ice deformation, Ice cover thickness, Antarctica—East Antarctica

53-2824

**Break-up of sea ice by ocean waves.**

Langhorne, P.J., Squire, V.A., Fox, C., Haskell, T.G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.438-442, 17 refs.

Fast ice, Ice edge, Ice water interface, Ocean waves, Ice cover strength, Ice deformation, Ice breakup, Antarctica—McMurdo Sound

53-2825

**On simulating high-frequency variability in arctic sea-ice dynamics models.**

Hibler, W.D., III, Heil, P., Lytle, V.I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.443-448, 10 refs.

Sea ice distribution, Ice conditions, Ice cover thickness, Ice cover strength, Ice water interface, Wind pressure, Air ice water interaction, Drift, Ice friction, Ice deformation, Ice models, Computerized simulation, Antarctica

53-2826

**Sea-ice pressure ridges in East Antarctica.**

Lytle, V.I., Worby, A.P., Massom, R.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.449-454, 14 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Ice deformation, Pressure ridges, Ice surface, Ice volume, Aerial surveys, Topographic surveys, Spaceborne photography, Antarctica—East Antarctica

53-2827

**Atmospheric drag coefficients of Weddell Sea ice computed from roughness profiles.**

Fisher, R., Lytle, V.I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.455-460, 22 refs.

Sea ice distribution, Ice floes, Ice friction, Ice deformation, Ice surface, Surface roughness, Drift, Ice water interface, Ice air interface, Wind pressure, Ice models, Computerized simulation, Antarctica—Weddell Sea

53-2828

**Brine infiltration in the snow cover of sea ice in the eastern Weddell Sea, Antarctica.**

Rapley, M., Lytle, V.I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.461-465, 16 refs.

Sea ice distribution, Ice cover thickness, Snow ice interface, Slush, Brines, Seepage, Ice heat flux, Ice growth, Statistical analysis, Antarctica—Weddell Sea

53-2829

**Radiometric measurements of sea-ice surface temperature in East Antarctica.**

Michael, K.J., Hungria, C.S., Massom, R.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.466-470, 19 refs.

Sea ice, Ice cover thickness, Snow ice interface, Snow cover effect, Ice surface, Ice air interface, Ice heat flux, Ice thermal properties, Ice temperature, Surface temperature, Radiometry, Antarctica—East Antarctica

53-2830

**Non-linear thermal transport and brine convection in first-year sea ice.**

McGuinness, M.J., Trodahl, H.J., Collins, K., Haskell, T.G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.471-476, 17 refs.

Sea ice, Ice thermal properties, Ice temperature, Ice heat flux, Brines, Seepage, Antarctica—McMurdo Sound

53-2831

**East Antarctic seasonal sea-ice and ocean stability: a model study.**

Marsland, S., Wolff, J.O., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.477-482, 20 refs.

Sea ice, Ice cover effect, Ice heat flux, Sea water freezing, Salinity, Ice growth, Ice melting, Ice water interface, Air ice water interaction, Ice models, Computerized simulation, Antarctica—East Antarctica

53-2832

**Antarctic Circumpolar Wave in a coupled ocean-atmosphere model.**

Motoi, T., Kitoh, A., Koide, H., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.483-487, 13 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Sea ice distribution, Ice cover effect, Air ice water interaction, Ice heat flux, Global change, Ice models, Computerized simulation, Antarctica

53-2833

**Intra-annual variability of antarctic precipitation from weather forecasts and high-resolution climate models.**

Genthon, C., Krinner, G., Déqué, M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.488-494, 12 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Precipitation (meteorology), Meteorological data, Weather forecasting, Statistical analysis, Computerized simulation, Antarctica

53-2834

**Antarctic sea-ice simulations with a coupled ocean/sea-ice model on a telescoped grid.**

Wolff, J.O., Bye, J.A.T., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.495-500, 22 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Sea ice distribution, Ice cover thickness, Ice heat flux, Ice cover effect, Air ice water interaction, Ice models, Mathematical models, Computerized simulation, Antarctica

53-2835

**Drift patterns in an antarctic channel from a quasi-geostrophic model with surface friction.**

Wolff, J.O., Bye, J.A.T., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.501-506, 13 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Air water interactions, Icebergs, Drift, Mathematical models, Computerized simulation, Antarctica

53-2836

**Evaluation of a regional atmospheric model for January 1993, using in situ measurements from the Antarctic.**

Van Lipzig, N.P.M., Van Meijgaard, E., Oerlemans, J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.507-514, 36 refs.

Polar atmospheres, Atmospheric circulation, Air temperature, Temperature gradients, Humidity, Ice sheets, Glacial meteorology, Glacier mass balance, Computerized simulation, Antarctica

53-2837

**Surface climate of the interior of the Lambert Glacier basin, Antarctica, from automatic weather station data.**

Allison, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.515-520, 16 refs.

Weather stations, Meteorological data, Air temperature, Wind direction, Wind velocity, Snow accumulation, Glacial meteorology, Topographic effects, Antarctica—Lambert Glacier

53-2838

**Global atmospheric responses to antarctic forcing.**

Bromwich, D.H., Chen, B., Hines, K.M., Cullather, R.I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.521-527, 23 refs.

Ice shelves, Glacier melting, Ice breakup, Sea ice distribution, Ice melting, Air ice water interaction, Atmospheric circulation, Global warming, Computerized simulation, Antarctica

53-2839

**Automatic weather station program during Dome Fuji Project by JARE in east Dronning Maud Land, Antarctica.**

Takahashi, S., et al, *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.528-534, 19 refs.

Polar atmospheres, Atmospheric circulation, Weather stations, Meteorological data, Wind velocity, Wind direction, Insolation, Atmospheric pressure, Air temperature, Temperature gradients, Antarctica—Queen Maud Land

53-2840

**Spatial distribution and seasonal pattern of biogenic sulphur compounds in snow from northern Victoria Land, Antarctica.**

Udisti, R., Traversi, R., Becagli, S., Piccardi, G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.535-542, 32 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow samplers, Snow composition, Snow impurities, Statistical analysis, Antarctica—Victoria Land

53-2841

**Regional impacts of climate change in the Arctic and Antarctic.**

Weller, G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.543-552, 27 refs.

Polar atmospheres, Global warming, Environmental impact, Regional planning, Computerized simulation, Antarctica

53-2842

Detection of temperature and sea-ice-extent changes in the Antarctic and southern ocean, 1949-96.

Jacka, T.H., Budd, W.F., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.553-559, 10 refs.

Polar atmospheres, Marine atmospheres, Weather stations, Meteorological data, Air temperature, Surface temperature, Sea ice distribution, Ice edge, Climatic changes, Global warming, Data processing, Statistical analysis, Antarctica

53-2843

Monitoring of atmospheric aerosol particles on the Antarctic Peninsula.

Correia, A., Artaxo, P., Maenhaut, W., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.560-564, 21 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Aerosols, Air pollution, Geochemical cycles, Statistical analysis, Antarctica—Comandante Ferraz Station

53-2844

Comparison of warming trends over the last century around Antarctica from three coupled models.

Connolley, W.M., O'Farrell, S.P., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.565-570, 18 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Carbon dioxide, Air temperature, Sea ice distribution, Air ice water interaction, Climatic changes, Global warming, Ice models, Computerized simulation, Antarctica

53-2845

Climate change in the western Antarctic Peninsula since 1945: observations and possible causes.

King, J.C., Harangozo, S.A., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.571-575, 17 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air temperature, Sea ice distribution, Ice edge, Air ice water interaction, Climatic changes, Global warming, Statistical analysis, Antarctica—Antarctic Peninsula

53-2846

Comparison of warming trends predicted over the next century around Antarctica from two coupled models.

O'Farrell, S.P., Connolley, W.M., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.576-582, 15 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Air temperature, Water temperature, Air ice water interaction, Sea ice distribution, Ice conditions, Climatic changes, Global warming, Computerized simulation, Antarctica

53-2847

Areal distribution of the oxygen-isotope ratio in Antarctica: comparison of results based on field and remotely sensed data.

Zwally, H.J., Giovinetto, M., Craven, M., Morgan, V., Goodwin, I., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.583-590, 33 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Oxygen isotopes, Isotope analysis, Air temperature, Ice sheets, Ice shelves, Core samplers, Ice composition, Climatic changes, Global change, Mathematical models, Statistical analysis, Antarctica

53-2848

Understanding Antarctic Peninsula precipitation distribution and variability using a numerical weather prediction model.

Turner, J., Leonard, S., Lachlan-Cope, T., Marshall, G.J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.591-596, 10 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Precipitation (meteorology), Snowfall, Snow accumulation, Snow samplers, Core samplers, Climatic changes, Computerized simulation, Antarctica—Antarctic Peninsula

53-2849

Seasonal variations of cloud and precipitation at Syowa Station, Antarctica.

Konishi, H., Wada, M., Endoh, T., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.597-602, 12 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Cloud cover, Clouds (meteorology), Precipitation (meteorology), Snowfall, Antarctica—Showa Station

53-2850

Surface energy balance and meltwater production for a dry valley glacier, Taylor Valley, Antarctica.

Lewis, K.J., Fountain, A.G., Dana, G.L., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.603-609, 15 refs.

Glacier surveys, Glacier oscillation, Glacial meteorology, Glacier heat balance, Glacier mass balance, Glacier ablation, Ice sublimation, Glacial hydrology, Glacier melting, Meltwater, Glacial lakes, Antarctica—Canada Glacier

53-2851

Interpreting recent accumulation records through an understanding of the regional synoptic climatology: an example from the southern Antarctic Peninsula.

Marshall, G.J., Turner, J., Miners, W.D., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.610-616, 25 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Precipitation (meteorology), Snow accumulation, Ice cores, Core samplers, Ice electrical properties, Ice composition, Climatic changes, Computerized simulation, Statistical analysis, Antarctica—Antarctic Peninsula

53-2852

Multi-decadal climate variability in the antarctic region and global change.

Simmonds, I., Jones, D.A., Walland, D.J., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.617-622, 31 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air ice water interaction, Global warming, Computerized simulation, Antarctica

53-2853

Monitoring climate variability on the Antarctic Peninsula by means of observations of the snow cover.

Schneider, C., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.623-627, 16 refs.

Snowfall, Snow cover distribution, Snow accumulation, Snow heat flux, Glacial meteorology, Glacier alimention, Glacier heat balance, Glacier oscillation, Glacier surveys, Synthetic aperture radar, Spaceborne photography, Climatic changes, Computerized simulation, Antarctica—Antarctic Peninsula

53-2854

Evidence of recent climatic warming on the eastern Antarctic Peninsula.

Skvarca, P., Rack, W., Rott, H., Ibarzabal y Donángelo, T., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.628-632, 15 refs.

Polar atmospheres, Marine atmospheres, Weather stations, Meteorological data, Air temperature, Glacial meteorology, Glacier oscillation, Ice shelves, Glacier melting, Climatic changes, Global warming, Statistical analysis, Antarctica—Antarctic Peninsula

53-2855

Recent retreat of ice cliffs, King George Island, South Shetland Islands, Antarctic Peninsula.

Park, B.K., Chang, S.K., Yoon, H.I., Chung, H.S., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.633-635, 13 refs.

Glacier surveys, Glacier oscillation, Glacial meteorology, Aerial surveys, Topographic surveys, Climatic changes, Global warming, Antarctica—King George Island

53-2856

Climate-change indicators from archival aerial photography of the Antarctic Peninsula.

Fox, A.J., Cooper, A.P.R., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.636-642, 6 refs.

Aerial surveys, Photointerpretation, Terrain identification, Glacier surveys, Glacier oscillation, Snow cover distribution, Climatic changes, Antarctica—Antarctic Peninsula

53-2857

Ice-front change and iceberg behaviour along Oates and George V Coasts, Antarctica, 1912-96.

Frezzotti, M., Cimbelli, A., Ferrigno, J.G., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.643-650, 36 refs.

Glacier surveys, Ice shelves, Glacier tongues, Glacier oscillation, Glacier thickness, Glacier mass balance, Glacier ablation, Calving, Icebergs, Antarctica—Oates Coast, Antarctica—George V Coast

53-2858

**Geoelectric field: a link between the troposphere and solar variability.**

Burns, G.B., Frank-Kamenetskiĭ, A.V., Troshichev, O.A., Bering, E.A., Papitashvili, V.O., *Annals of glaciology*, 1998, Vol.27, International Symposium on Antarctica and Global Change: Interactions and Impacts, Hobart, Tasmania, Australia, July 13-18, 1997. Papers. Edited by W.F. Budd, et al, p.651-654, 14 refs.

Polar atmospheres, Atmospheric physics, Atmospheric electricity, Solar activity, Geomagnetism, Geoelectricity, Climatic changes, Antarctica—Vostok Station

53-2859

**PANGAEA information system for glaciological data management.**

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Glacier surveys, Ice cores, Paleoclimatology, Research projects, Data processing, Data transmission, Computer programs

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Polar atmospheres, Atmospheric composition, Atmospheric physics, Air temperature, Temperature measurement, Climatic changes, Global change, Antarctica

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Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Ice cores, Core samplers, Snow samplers, Snow composition, Glacier ice, Ice composition, Isotope analysis, Ice dating, Climatic changes, Antarctica—Campbell Glacier

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Glacial lakes, Frozen lakes, Lake water, Water chemistry, Carbon isotopes, Isotope analysis, Nutrient cycle, Geochemical cycles, Algae, Biomass, Antarctica—Hoare, Lake, Antarctica—Fryxell, Lake

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Polar atmospheres, Frozen lakes, Lake ice, Ice conditions, Ice cover effect, Limnology, Photosynthesis, Light transmission, Nutrient cycle, Geochemical cycles, Water chemistry, Lacustrine deposits, Paleobotany, Paleoclimatology, Global change, Antarctica

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53-2918

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Research projects, Stations, Logistics, Cold weather construction, Cold weather operation, Traverses, Ice cores, Meteorological data, Antarctica—Showa Station, Antarctica—Dome Fuji Station

53-2920

**Activities of the summer party of the 39th Japanese Antarctic Research Expedition in 1997-1998. [Dai 39 ji Nankyoku chikiki kansokutai kaki kodo hokoku 1997-1998]**

Moriwaki, K., *Antarctic record*, Nov. 1998, 42(3), p.300-320, In Japanese with English summary. 2 refs.

Research projects, Stations, Logistics, Cold weather operation, Cold weather construction, Traverses, Oceanographic surveys, Antarctica—Showa Station, Antarctica—Dome Fuji Station



## 53-2921

**Economic value of the International Ice Patrol.** Pritchett, C.W., *U.S. Coast Guard Research and Development Center. Report*, Jan. 1997, USCG-D-14-97, 10p. + append., ADA-323 740, 7 refs. Icebergs, Ice detection, Ice forecasting, Ice reporting, Ice routing, Safety, Cost analysis

## 53-2922

## FYI 38: Icing.

Larabee, S., *U.S. Air Force Air Weather Service, Scott AFB, IL. Report*, Mar. 1997, 12p. + figs., ADA-324 098, 11 refs.

Aircraft icing, Ice accretion, Ice forecasting, Cloud physics, Weather forecasting

## 53-2923

**Constitutive laws for sea ice dynamics models.** Pritchard, R.S., San Rafael, CA, Icecasting, Inc., 1997, 4p., ADA-331 572, 10 refs.

Research projects, Sea ice distribution, Ice conditions, Ice cover thickness, Ice forecasting, Ice models, Computerized simulation

## 53-2924

**Mountain terrain analysis using a knowledge-based interface to a GIS.**

Peddle, D.R., Duguay, C.R., *Geomatica*, 1998, 52(3), p.265-272, With French summary. 22 refs.

Alpine landscapes, Alpine tundra, Topographic surveys, Terrain identification, Computer programs, Data processing, Image processing, Mapping, Rocky Mountains

## 53-2925

**St. Lawrence River Valley 1998 ice storm: maps and facts.**

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Ice storms, Power line icing, Ice loads, Accidents, Rescue operations, Cost analysis, Canada—Saint Lawrence River

## 53-2926

**Caltrans fleet clears mountain roads.**

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Snow removal, Snow removal equipment, Highway planning, Road maintenance, Cost analysis, United States—California—Sierra Nevada

## 53-2927

**Rates and magnitudes of paraglacial fan formation in the Garhwal Himalaya: implications for landscape evolution.**

Owen, L.A., Sharma, M.C., *Geomorphology*, Dec. 1998, 26(1-3), p.171-184, 29 refs.

Geomorphology, Mountains, Landscape development, Glacial geology, Moraines, Outwash, Sedimentation, Glacial erosion, Mass movements (geology), India—Himalaya Mountains

## 53-2928

**Slope denudation and the supply of debris to cones in Langtang Himal, central Nepal Himalaya.**

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Geomorphology, Slope processes, Landforms, Glacial geology, Bedrock, Moraines, Rock streams, Sedimentation, Freeze thaw cycles, Photogrammetry, Radioactive age determination, Geochronology, Nepal—Himalaya Mountains

## 53-2929

**Observations on rock glaciers in the Himalayas and Karakoram Mountains of northern Pakistan and India.**

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Glacial geology, Periglacial processes, Geomorphology, Landscape development, Rock glaciers, Permafrost physics, Talus, Moraines, Mass flow, Classifications, India—Himalaya Mountains, Pakistan—Karakoram Mountains

## 53-2930

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## 53-2931

**Physical characteristics of summer sea ice across the Arctic Ocean.**

Tucker, W.B., Gow, A.J., Meese, D.A., Bosworth, H.W., Reimnitz, E., *Journal of geophysical research*, Jan. 15, 1999, 104(C1), p.1489-1504, 64 refs.

Oceanographic surveys, Ice surveys, Sea ice distribution, Ice structure, Physical properties, Chemical properties, Albedo, Ice cores, Ponds, Sediment transport, Ice rafting, Radiometry, Thin sections, Arctic Ocean

Sea ice characteristics were investigated during July and Aug. on the 1994 transect across the Arctic Ocean. Properties examined from ice cores included salinity, temperature and ice structure. Salinities measured near zero at the surface, increasing to 3-4 per mill at the ice-water interface. Ice crystal texture was dominated by columnar ice, comprising 90% of the ice sampled. Surface albedos of various ice types, measured with radiometers, showed integrated shortwave albedos of 0.1 to 0.3 for melt ponds, 0.5 for bare, discolored ice, and 0.6 to 0.8 for a deteriorated surface or snow-covered ice. Aerial photography was utilized to document the distribution of open melt ponds, which decreased from 12% coverage of the ice surface in late July at 76°N to almost none in mid-Aug. at 88°N. Most melt ponds were shallow, and depth bore no relationship to size. Sediment was pervasive from the southern Chukchi Sea to the north pole, occurring in bands or patches. It was absent in the Eurasian Arctic, where it had been observed on earlier expeditions. Calculations of reverse trajectories of the sediment-bearing flows suggest that the southernmost sediment was entrained during ice formation in the Beaufort Sea while more northerly samples probably originated in the East Siberian Sea, some as far west as the New Siberian Islands.

## 53-2932

**Location and dynamics of the Antarctic Polar Front from satellite sea surface temperature data.**

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Oceanography, Subpolar regions, Ocean currents, Boundary layer, Bottom topography, Topographic effects, Surface temperature, Spaceborne photography, Sensor mapping, Seasonal variations, Temperature effects, Statistical analysis, Antarctica

## 53-2933

**Tides and tidal torques of the world ocean since the last glacial maximum.**

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Pleistocene, Oceanography, Glacier oscillation, Ice cover effect, Tides, Friction, Sea level, Gravity, Mathematical models, Hydrodynamics, Turbulent exchange, Mathematical models

## 53-2934

**Non-Redfield carbon and nitrogen cycling in the Arctic: effects of ecosystem structure and dynamics.**

Daly, K.L., et al, *Journal of geophysical research*, Feb. 15, 1999, 104(C2), p.3185-3199, Refs. p.3197-3199.

Subpolar regions, Marine biology, Ecosystems, Biomass, Plankton, Water chemistry, Particles, Solubility, Geochemical cycles, Nutrient cycle, Sampling, Indexes (ratios), Accuracy, Arctic Ocean

## 53-2935

**Investigations of Fennoscandian glacial isostatic adjustment using modern sea level records.**

Davis, J.L., Mitrovica, J.X., Scherneck, H.G., Fan, H., *Journal of geophysical research*, Feb. 10, 1999, 104(B2), p.2733-2747, 38 refs.

Marine geology, Glacial geology, Subpolar regions, Sea level, Tides, Isostasy, Ice cover effect, Models, Viscoelasticity, Statistical analysis, Seasonal variations, Correlation, Baltic Sea

## 53-2936

**Experimental and theoretical fracture mechanics applied to antarctic ice fracture and surface crevassing.**

Rist, M.A., et al, *Journal of geophysical research*, Feb. 10, 1999, 104(B2), p.2973-2987, 74 refs.

Ice shelves, Ice mechanics, Crack propagation, Cracking (fracturing), Tensile properties, Crevasses, Orientation, Ice cores, Mechanical tests, Models, Theories, Antarctica—Ronne Ice Shelf, Antarctica—Filchner Ice Shelf

## 53-2937

**Freezing and melting of water in a single cylindrical pore: the pore-size dependence of freezing and melting behavior.**

Morishige, K., Kawano, K., *Journal of chemical physics*, Mar. 8, 1999, 110(10), p.4867-4872, 44 refs.

Ice physics, Water structure, Adsorption, Supercooling, Freezing points, Melting points, Phase transformations, Hygroscopic water, Freeze thaw cycles, Ice water interface, Porous materials, X ray diffraction

## 53-2938

**Evidence for a substantial role for dilution in northern mid-latitude ozone depletion.**

Knudsen, B.M., Lahoz, W.A., O'Neill, A., Morcrette, J.J., *Geophysical research letters*, Dec. 15, 1998, 25(24), p.4501-4504, 25 refs.

Climatology, Ozone, Photochemical reactions, Degradation, Polar atmospheres, Air masses, Migration, Advection

## 53-2939

**Automatic orbital tuning method for paleoclimate records.**

Yu, Z.W., Ding, Z.L., *Geophysical research letters*, Dec. 15, 1998, 25(24), p.4525-4528, 17 refs.

Paleoclimatology, Pleistocene, Climatic changes, Loess, Grain size, Sediments, Geochronology, Insolation, Mathematical models, Spectra, Correlation

## 53-2940

**Extreme fractionation of gases caused by formation of clathrate hydrates in Vostok antarctic ice.**

Ikeda, T., et al, *Geophysical research letters*, Jan. 1, 1999, 26(1), p.91-94, 28 refs.

Glaciology, Glacier ice, Ice physics, Ice air interface, Phase transformations, Bubbles, Natural gas, Vapor transfer, Clathrates, Hydrates, Ice spectroscopy, Antarctica

## 53-2941

**History of the last deglaciation and Holocene in the Nordic seas as revealed by coccolithophore assemblages.**

Andruleit, H.A., Baumann, K.H., *Marine micropaleontology*, Dec. 1998, 35(3-4), p.179-201, 57 refs.

Pleistocene, Paleocology, Plankton, Oceanography, Ocean currents, Subpolar regions, Glaciation, Bottom sediment, Drill core analysis, Radioactive age determination, Geochronology, Correlation, Atlantic Ocean, Norwegian Sea, Iceland Sea, Greenland Sea

## 53-2942

**Variability of snowmelt runoff and soil moisture recharge.**

Harms, T.E., Chanasyk, D.S., *Nordic hydrology*, 1998, 29(3), p.179-198, 18 refs.

Snow hydrology, Watersheds, Snowmelt, Runoff, Snow water equivalent, Soil water, Moisture transfer, Slope orientation, Soil temperature, Seasonal variations, Meteorological factors, Flow measurement, Canada—Alberta

## 53-2943

**Observations of ice and its sediments on the Baltic Sea coast.**

Leppäranta, M., Tikkanen, M., Shemeikka, P., *Nordic hydrology*, 1998, 29(3), p.199-220, 24 refs.

Oceanography, Sea ice, Sedimentation, Suspended sediments, Ice microstructure, Impurities, Snow ice interface, Salinity, Solubility, Meltwater, Chemical analysis, Thin sections, Baltic Sea

53-2944

**Snowpack chemistry during snow accumulation and melt in mature subalpine forest and regenerating clear-cut in the southern interior of B.C.** Hudson, R.O., Golding, D.L., *Nordic hydrology*, 1998, 29(3), p.221-244, 28 refs. Snow hydrology, Metamorphism (snow), Watersheds, Vegetation factors, Hydrogeochemistry, Meltwater, Leaching, Impurities, Sampling, Ion density (concentration), Profiles, Statistical analysis, Canada—British Columbia

53-2945

**Neotectonics and seismicity in the south-eastern Beaufort Sea, polar continental margin of north-western Canada.** Stephenson, R.A., Smolianova, E.I., *Journal of geodynamics*, Mar. 1999, 27(2), p.175-190, Refs. p.188-190. Tectonics, Geological surveys, Marine geology, Subpolar regions, Earthquakes, Subsidence, Earth crust, Shear stress, Seismic refraction, Profiles, Mathematical models, Beaufort Sea

53-2946

**Holocene environmental history of a peatland in the Lena River valley, Siberia.** Jasinski, J.P.P., et al, *Canadian journal of earth sciences*, June 1998, 35(6), p.637-648, With French summary, 49 refs. Paleocology, Palynology, Landscape development, Subpolar regions, Polygonal topography, Permafrost structure, Active layer, Quaternary deposits, Peat, Soil formation, Stratigraphy, Drill core analysis, Radioactive age determination, Russia—Siberia

53-2947

**Biomass burning signatures in the atmosphere of central Greenland.** Jaffrezo, J.L., et al, *Journal of geophysical research*, Dec. 20, 1998, 103(D23), p.31,067-31,078, 59 refs. Climatology, Polar atmospheres, Ice sheets, Snow composition, Atmospheric composition, Aerosols, Sedimentation, Solubility, Biomass, Forest fires, Particle size distribution, Sampling, Origin, Greenland

53-2948

**Spreading and growth of contrails in a sheared environment.** Jensen, E.J., Ackerman, A.S., Stevens, D.E., Toon, O.B., Minnis, P., *Journal of geophysical research*, Dec. 27, 1998, 103(D24), p.31,557-31,567, 24 refs. Climatology, Atmospheric composition, Cloud physics, Aerosols, Condensation trails, Vapor diffusion, Water content, Shear flow, Ice crystal growth, Heterogeneous nucleation, Radiant heating, Age determination, Simulation

53-2949

**Correction of thin cirrus path radiance in the 0.4-1.0  $\mu$ m spectral region using the sensitive 1.375  $\mu$ m cirrus detecting channel.** Gao, B.C., Kaufman, Y.J., Han, W., Wiscombe, W.J., *Journal of geophysical research*, Dec. 27, 1998, 103(D24), p.32,169-32,176, 15 refs. Remote sensing, Infrared spectroscopy, Cloud physics, Ice crystals, Ice optics, Radiance, Reflectivity, Resolution, Radiation absorption, Countermeasures, Image processing

53-2950

**Late 20th century increase in South Pole snow accumulation.** Mosley-Thompson, E., Paskievitch, J.F., Gow, A.J., Thompson, L.G., MP 5308, *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3877-3886, 49 refs. Climatology, Global change, Global warming, Polar atmospheres, Precipitation (meteorology), Snow accumulation, Snow water equivalent, Ice cores, Isotope analysis, Seasonal variations, Statistical analysis, Antarctica—Amundsen-Scott Station A compilation of the 37-year history of net accumulation at the South Pole suggests an increase in net annual accumulation since 1965. This record is sporadic and its quality is compromised by spatially restricted observations and nonsystematic measurement procedures. Results from a new, spatially extensive network of 236 accumulation poles document that the current 5-year (1992-97) average annual net accumulation at the South Pole is 84.4 $\pm$ 8.9 mm water equivalent (w.e.). This accumulation rate reflects a 30% increase

since the 1960s when the best, although not optimal, records indicate that it was 65 mm w.e. Identification of two prominent beta radioactivity horizons (1954-55 and 1964-65) in six firm cores confirms an increase in accumulation since 1965. Viewed from a longer perspective of accumulation provided by ice cores and a snow mine study, the net accumulation of the 30-year period, 1965-1994, is the highest 30-year average of this millennium. Limited data suggest this recent accumulation increase extends beyond the South Pole region and may be characteristic of the high East Antarctic Plateau. Enhanced accumulation over the polar ice sheets has been identified as a potential early indicator of warmer sea surface temperatures and may offset a portion of the current rise in global sea level.

53-2951

**Importance of thermodynamics for modeling the volume of the Greenland ice sheet.** Van de Wal, R.S.W., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3887-3898, 24 refs. Pleistocene, Glaciology, Ice sheets, Glacier mass balance, Glacier flow, Ice volume, Spectra, Ice temperature, Surface energy, Thermodynamics, Models, Temperature effects, Greenland—Summit

53-2952

**Processes of buildup and retreat of the Greenland ice sheet.** Van de Wal, R.S.W., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3899-3906, 36 refs. Pleistocene, Ice sheets, Subpolar regions, Glacier oscillation, Glacier mass balance, Ice volume, Basal sliding, Bedrock, Insolation, Radiation balance, Thermodynamics, Models, Greenland

53-2953

**Annual cycle of energy balance of Zongo Glacier, Cordillera Real, Bolivia.** Wagnon, P., Ribstein, P., Francou, B., Pouyaud, B., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3907-3923, 33 refs. Glaciology, Mountain glaciers, Glacier mass balance, Surface energy, Radiation balance, Albedo, Heat flux, Turbulent exchange, Surface roughness, Seasonal variations, Snow evaporation, Sampling, Bolivia—Zongo Glacier

53-2954

**Energy exchange in early spring over sea ice in the Pacific sector of the southern ocean.** Hauser, A., Wendler, G., Adolphs, U., Jeffries, M.O., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3925-3935, 40 refs. Climatology, Sea ice, Albedo, Cloud cover, Radiation balance, Atmospheric boundary layer, Marine atmospheres, Snow ice interface, Heat flux, Turbulent exchange, Snow cover effect, Ice cover effect, Diurnal variations, Photometry, Antarctica—Ross Sea, Antarctica—Weddell Sea, Antarctica—Bellinghousen Sea

53-2955

**Atmospheric transmission of North Atlantic Heinrich events.** Hostetler, S.W., Clark, P.U., Bartlein, P.J., Mix, A.C., Pisias, N.J., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3947-3952, 48 refs. Paleoclimatology, Climatic changes, Atmospheric composition, Natural gas, Ocean currents, Water balance, Surface temperature, Glacier oscillation, Glacier surges, Ice rafting, Ice cover effect, Models, Ice age theory, Atlantic Ocean

53-2956

**In situ measurements of effective diameter and effective droplet number concentration.** Korolev, A.V., Isaac, G.A., Strapp, J.W., Nevzorov, A.N., *Journal of geophysical research*, Feb. 27, 1999, 104(D4), p.3993-4003, 35 refs. Climatology, Cloud physics, Optical properties, Radiation, Scattering, Attenuation, Cloud droplets, Ice crystal optics, Water content, Probes, Spectroscopy

53-2957

**Environmentally friendly anti- or deicing compositions, and process for deicing the exterior surface of aircraft and motor vehicles, and of road surfaces and sidewalks, using the compositions.** Lockyer, R.T., Zuk, J., Haslim, L.A., *U.S. Patent Office. Patent*, June 30, 1998, n.p., USP-5,772,912, Cont.-in-part of USP-380913. Aircraft icing, Ice removal, Chemical ice prevention, Antifreezes, Environmental protection

53-2958

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53-2959

**Ice- and snow-repellent antennas.** Chouta, M., Hayakawa, M., *Japan Patent Office. Patent*, June 19, 1998, n.p., No.98163720. Antennas, Radomes, Ice prevention, Snow removal, Protective coatings

53-2960

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53-2961

**Environmentally benign deicing/anti-icing technology.** Sapienza, R.S., Heater, K.J., *U.S. Air Force Research Laboratory. Air Force Materiel Command, Wright-Patterson AFB, OH. Report*, June 1998, AFRLML-WP-TR-98-4045, 27p., ADA-346 962. Aircraft icing, Chemical ice prevention, Antifreezes, Environmental protection

53-2962

**GPS heading determination using short antenna baselines.** Vinnins, M., Gallop, L.D., *Canada. Defence Research Establishment, Ottawa. Technical note*, Apr. 1997, DREO-TN-98-001, 56p., ADA-341 662, With French summary, 17 refs. Sea ice distribution, Ice conditions, Ice detection, Ice surveys, Drift, Ice reporting, Ice forecasting, Telemetering equipment, Canada

53-2963

**Evaluation of the natural biodegradation of aircraft deicing fluid components in soils.** Johnson, L.M., *U.S. Air Force Institute of Technology, Wright-Patterson AFB, OH. Report*, Dec. 1997, AFIT/GEE/ENV/97D-12, Var. p. + append., ADA-334 350, M.S. thesis submitted to Air Force Institute of Technology, Air University, Wright-Patterson AFB, OH, 35 refs. Aircraft icing, Chemical ice prevention, Antifreezes, Soil pollution, Soil microbiology, Bacteria, Decomposition

53-2964

**Ice-cover influence on near-field mixing in dune-bed channel: numerical simulation.** Tan, C.A., Sinha, S.K., Ettema, R., *Journal of cold regions engineering*, Mar. 1999, 13(1), p.1-20, 22 refs. River flow, Hydrodynamics, River ice, Channels (waterways), Bottom topography, Ice cover effect, Buoyancy, Water intakes, Turbulent diffusion, Mathematical models, Impurities

53-2965

**Servo-hydraulic pin loading device (HPLD) for in situ ice testing.** Vincent, M.R., Dempsey, J.P., *Journal of cold regions engineering*, Mar. 1999, 13(1), p.21-36, 11 refs. Ice mechanics, Floating ice, Loading, Dynamic loads, Stabilization, Ice solid interface, Mechanical tests, Cracking (fracturing), Test equipment, Design criteria, Performance, Computer applications

## 53-2966

**Field testing of stabilized soil.**

Janoo, V.C., Firicano, A.J., Barna, L.A., Orchino, S.A., MP 5309, *Journal of cold regions engineering*, Mar. 1999, 13(1), p.37-53, 8 refs.

Soil tests, Pavement bases, Subgrade soils, Soil strength, Bearing strength, Compressive properties, Soil stabilization, Freeze thaw cycles, Frost penetration, Penetration tests

Remediation of a Superfund site in Stratford, CT, involved stabilization of the subgrade with portland cement. Part of the remediation site was to be used as a parking area. The stabilized soil was to be covered with natural base/subbase coarse materials and capped with an asphalt concrete cover. During the course of the remediation, a base-course layer could not be placed prior to the onset of winter. A field study was conducted to quantify any changes in the mechanical properties of the open stabilized subgrade subjected to freeze-thaw cycling during the winter of 1996-97. Field evaluation was conducted with pavement industry tools: the Clegg impact hammer and the dynamic cone penetrometer. Evaluation results show the viability of the Clegg hammer as an instrument for quality assurance and also show that there can be up to 50% loss in compressive strength of the subgrade within the uppermost layer of the material caused by freeze-thaw cycling.

## 53-2967

**Frozen ground conditions in the Russian Arctic during the Middle Pleistocene-Holocene.**

Rozenbaum, G.E., Shpolianskaia, N.S., *Polar geography*, Oct.-Dec. 1998, 22(4), p.249-267, Translated from Akademii nauk. Izvestiia. Seria geograficheskaiia. Refs. p.265-267.

Pleistocene, Paleoclimatology, Climatic changes, Geocryology, Subpolar regions, Permafrost transformation, Permafrost distribution, Permafrost thickness, Models, Classifications, Oscillations, Russia—Siberia

## 53-2968

**Contamination of bottom sediments in Kola Bay, Russia.**

Matishov, G.G., et al, *Polar geography*, Oct.-Dec. 1998, 22(4), p.283-292, Translated from Akademii nauk. Izvestiia. Seria geograficheskaiia. 19 refs.

Oceanographic surveys, Water pollution, Subpolar regions, Bottom sediment, Hydrocarbons, Metals, Sampling, Environmental tests, Russia—Kola Bay

## 53-2969

**Carbon accumulation in the mineral subsoil of boreal mires.**

Turunen, J., Tolonen, K., Tolvanen, S., Remes, M., Ronkainen, J., Jungner, H., *Global biogeochemical cycles*, Mar. 1999, 13(1), p.71-79, 53 refs.

Geochemical cycles, Podsol, Paludification, Subpolar regions, Ecosystems, Peat, Swamps, Carbon dioxide, Subgrade soils, Soil dating, Radioactive age determination, Finland

## 53-2970

**Controls on CH<sub>4</sub> emissions from a northern peatland.**

Bellisario, L.M., Bubier, J.L., Moore, T.R., Chanton, J.P., *Global biogeochemical cycles*, Mar. 1999, 13(1), p.81-91, 48 refs.

Discontinuous permafrost, Peat, Wetlands, Biomass, Plant tissues, Decomposition, Water table, Geochemical cycles, Natural gas, Vapor transfer, Soil air interface, Vegetation factors, Sampling, Canada—Manitoba—Thompson

## 53-2971

**Methane flux in subalpine wetland and unsaturated soils in the southern Rocky Mountains.**

Wickland, K.P., Striegl, R.G., Schmidt, S.K., Mast, M.A., *Global biogeochemical cycles*, Mar. 1999, 13(1), p.101-113, 69 refs.

Soil chemistry, Mountain soils, Wetlands, Alpine landscapes, Natural gas, Vapor diffusion, Snow cover effect, Geochemical cycles, Soil air interface, Soil temperature, Seasonal variations, Sampling, United States—Colorado—Rocky Mountain National Park

## 53-2972

**Use of SSM/I ice concentration data in the ECMWF SST analysis.**

Fernandez, P., Kelly, G., Saunders, R., *Meteorological applications*, Dec. 1998, 5(4), p.287-296, 8 refs. Radiometry, Climatology, Polar atmospheres, Sea ice distribution, Ice edge, Seasonal variations, Water temperature, Ice temperature, Surface temperature, Weather forecasting, Statistical analysis, Antarctica

## 53-2973

**Particle size estimation in ice-phase clouds using multifrequency radar reflectivity measurements at 95, 33, and 2.8 GHz.**

Sekelsky, S.M., Ecklund, W.L., Firda, J.M., Gage, K.S., McIntosh, R.E., *Journal of applied meteorology*, Jan. 1999, 38(1), p.5-28, 53 refs. Precipitation (meteorology), Cloud physics, Thunderstorms, Radar echoes, Profiles, Ice crystal optics, Refractivity, Ice detection, Particle size distribution, Mathematical models

## 53-2974

**Microwave properties of frozen precipitation around a North Atlantic cyclone.**

Schols, J.L., Weinman, J.A., Alexander, G.D., Stewart, R.E., Angus, L.J., Lee, A.C.L., *Journal of applied meteorology*, Jan. 1999, 38(1), p.29-43, 41 refs.

Precipitation (meteorology), Cloud physics, Storms, Spacecraft, Radiometry, Brightness, Falling snow, Ice detection, Aggregates, Snow melting, Profiles, Mathematical models, North Atlantic Ocean

## 53-2975

**Using the Special Sensor Microwave/Imager to monitor land surface temperatures, wetness, and snow cover.**

Basist, A., Grody, N.C., Peterson, T.C., Williams, C.N., *Journal of applied meteorology*, Sep. 1998, 37(9), p.888-911, 36 refs. Climatology, Precipitation (meteorology), Atmospheric boundary layer, Surface temperature, Temperature measurement, Spacecraft, Radiometry, Brightness, Snow cover distribution, Snow cover effect, Indexes (ratios), Mathematical models, United States

## 53-2976

Loess soils of China as records of climatic change. Kemp, R.A., Derbyshire, E., *European journal of soil science*, Dec. 1998, 49(4), p.525-539, 62 refs. Pleistocene, Paleoclimatology, Climatic changes, Precipitation (meteorology), Loess, Sedimentation, Soil formation, Oxygen isotopes, Remanent magnetism, Stratigraphy, Soil dating, China

## 53-2977

**Late Cretaceous paleomagnetic data from the Median Range of Kamchatka, Russia: tectonic implications.**

Levasnova, N.M., Shapiro, M.N., Bazhenov, M.L., *Earth and planetary science letters*, Nov. 1998, 163(1-4), p.235-246, 30 refs.

Pleistocene, Geological surveys, Subpolar regions, Continental drift, Tectonics, Earth crust, Lithology, Geomagnetism, Rock properties, Magnetic properties, Sampling, Russia—Kamchatka Peninsula

## 53-2978

**Refining the eustatic sea-level curve since the Last Glacial Maximum using far- and intermediate-field sites.**

Fleming, K., Johnston, P., Zwart, D., Yokoyama, Y., Lambeck, K., Chappell, J., *Earth and planetary science letters*, Nov. 1998, 163(1-4), p.327-342, 50 refs. Pleistocene, Oceanography, Sea level, Glacier oscillation, Glacier melting, Meltwater, Ice volume, Isostasy, Models

## 53-2979

**Spring ozone column values over Thule, Greenland in the period 1991-1998.**

Andersen, S.B., *Geophysical research letters*, Jan. 15, 1999, 26(2), p.193-196, 13 refs. Climatology, Polar atmospheres, Atmospheric composition, Degradation, Aerosols, Ozone, Stratification, Seasonal variations, Spectroscopy, Greenland—Thule

## 53-2980

**On the frequency distribution of net annual snow accumulation at the South Pole.**

Van der Veen, C.J., Whillans, I.M., Gow, A.J., MP 5310, *Geophysical research letters*, Jan. 15, 1999, 26(2), p.239-242, 11 refs.

Paleoclimatology, Geochronology, Precipitation (meteorology), Polar atmospheres, Snow accumulation, Snow stratigraphy, Thickness, Seasonal variations, Statistical analysis, Accuracy, Antarctica—South Pole

The frequency distribution of stratigraphic layer thickness in cores and a snowmine at South Pole is not compatible with a significant number (>1%) of missing layers associated with zero-accumulation years inferred from pole-height measurements. A reconciliation of these data sets is needed if observed stratigraphic records are to be used as reliable paleoclimate indicators. Three explanations for the discrepancy are offered, namely (i) during a significant number of years, a visible stratigraphic horizon does not form or is not identified, (ii) the true distribution is characterized by two maxima, with a secondary maximum centered around zero layer thickness, or (iii) the pole-height measurements are misinterpreted and there are very few zero-accumulation years at South Pole. With the currently available data, it is not possible to discriminate among these three possibilities.

## 53-2981

**Compressive creep of ice containing a liquid intergranular phase: rate-controlling processes in the dislocation creep regime.**

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Ice physics, Glacier ice, Ice creep, Brines, Meltwater, Phase transformations, Liquid phases, Ice water interface, Ice deformation, Ice microstructure, Strain tests

## 53-2982

**Layers of antarctic krill, *Euphausia superba*: are they just long krill swarms?**

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Marine biology, Plankton, Ecology, Aggregates, Distribution, Stratification, Sampling, Sounding, Underwater acoustics, Antarctica—Elephant Island

## 53-2983

**Capability of dynamic photoinhibition in arctic macroalgae is related to their depth distribution.**

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Marine biology, Subpolar regions, Algae, Ecology, Growth, Photosynthesis, Photochemical reactions, Solar radiation, Light effects, Sampling, Simulation, Norway—Spitsbergen

## 53-2984

**North Atlantic deep water circulation collapse during Heinrich events.**

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Pleistocene, Oceanography, Subpolar regions, Ocean currents, Convection, Glacier melting, Ice rafting, Meltwater, Salinity, Icebergs, Models, Atlantic Ocean, Barents Sea

## 53-2985

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Mining, Gold, Subpolar regions, Lithology, Mineralogy, Hydrothermal processes, Sedimentation, Rock properties, Quaternary deposits, Geochemistry, Drill core analysis, Canada—Northwest Territories—Yellowknife

## 53-2986

**Plant responses to species removal and experimental warming in Alaskan tussock tundra.**

Hobbie, S.E., Shevtsova, A., Chapin, F.S., III, *Oikos*, Mar. 1999, No.84, p.417-434, Refs. p.432-434.

Plant ecology, Tundra vegetation, Forest ecosystems, Air temperature, Modification, Biomass, Growth, Temperature effects, Global warming, Greenhouse effect, Simulation, United States—Alaska—Toolik Lake

53-2987

Costs of reproduction in subarctic *Ranunculus acris*: a five-year field experiment.

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Plant ecology, Alpine landscapes, Plants (botany), Plant tissues, Modification, Growth, Modification, Statistical analysis, Sweden—Abisko

53-2988

Thermodynamic effects of sublimating, blowing snow in the atmospheric boundary layer.

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53-2989

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Ocean environments, Sea water, Marine biology, Suspended sediments, Air water interactions, Sea ice distribution, Ice cover effect, Algae, Biomass, Nutrient cycle, Geochemical cycles, Antarctica—Ross Sea

53-2990

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Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Air ice water interaction, Ice heat flux, Cloud cover, Radiation balance, Statistical analysis, Antarctica—Weddell Sea

53-2991

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Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Water chemistry, Isotopic labeling, Radioactive age determination, Arctic Ocean

53-2992

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Ocean currents, Water transport, Sea water, Water chemistry, Water pollution, Ice cover effect, Drift, Turbulent exchange, Mathematical models

53-2993

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Climatology, Polar atmospheres, Wind direction, Velocity measurement, Gravity waves, Oscillations, Geomagnetism, Optical phenomena, Detection, Spectra, Oscillations, Radar echoes, Canada—Northwest Territories—Resolute Bay

53-2994

Chemical ozone depletion during arctic winter 1997/98 derived from ground based millimeter-wave observations.

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Climatology, Polar atmospheres, Atmospheric composition, Stratosphere, Air masses, Aerosols, Degradation, Turbulent diffusion, Ozone, Radiometry, Profiles, Seasonal variations, Norway—Spitsbergen

53-2995

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Climatology, Polar atmospheres, Cloud physics, Cooling rate, Polar stratospheric clouds, Classifications, Particle size distribution, Optical properties, Thermodynamic properties, Lidar, Backscattering, Refractivity, Norway—Andenes

53-2996

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Exploration, Natural resources, Crude oil, Petroleum industry, Hydrocarbons, United States—Alaska

53-2997

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Pleistocene, Subpolar regions, Tectonics, Earth crust, Deformation, Hydrocarbons, Reservoirs, Exploration, United States—Alaska, Canada—Yukon Territory

53-2998

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Pleistocene, Glacial geology, Glaciation, Isostasy, Stratigraphy, Oxygen isotopes, Isotope analysis, Geochronology, Drill core analysis, Correlation, Antarctica

53-2999

Implications for sedimentation changes on the Iberian margin over the last two glacial/interglacial transitions from (<sup>230</sup>Th)<sub>excess</sub> systematics.

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Pleistocene, Oceanography, Marine geology, Marine deposits, Sedimentation, Ice rafting, Radioactive age determination, Drill core analysis, Radioactivity, Indexes (ratios), Atlantic Ocean

53-3000

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Pleistocene, Marine geology, Geomagnetism, Subpolar regions, Marine deposits, Ice rafting, Sedimentation, Drill core analysis, Stratigraphy, Geochronology, Radioactive age determination, Labrador Sea

53-3001

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Paleoclimatology, Climatic changes, Subpolar regions, Paleobotany, Palynology, Tundra vegetation, Quaternary deposits, Lacustrine deposits, Vegetation patterns, Drill core analysis, Iceland

53-3002

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Paleoclimatology, Climatic changes, Subpolar regions, Forest ecosystems, Palynology, Lacustrine deposits, Lake ice, Ice cores, Sedimentation, Forest fires, Radioactive age determination, Distribution, Finland

53-3003

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Climatology, Climatic changes, Global warming, Subarctic landscapes, Peat, Wetlands, Permafrost transformation, Soil air interface, Vapor transfer, Geochemical cycles, Carbon dioxide, Natural gas, Forecasting, Temperature effects, Canada—Northwest Territories

53-3004

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Climatic changes, Global warming, Permafrost hydrology, Wetlands, Ecosystems, Peat, Soil temperature, Continuous permafrost, Active layer, Water table, Geochemical cycles, Soil air interface, Vapor transfer, Models, Canada—Manitoba—Churchill

53-3005

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Paleoclimatology, Climatic changes, Landscape development, Soil formation, Paleocology, Subarctic landscapes, Continuous permafrost, Permafrost hydrology, Peat, Quaternary deposits, Stratigraphy, Drill core analysis, Vegetation patterns, Canada—Northwest Territories—Inuvik

53-3006

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Sea water, Water chemistry, Ocean currents, Biomass, Nutrient cycle, Geochemical cycles, Antarctica—Ross Sea, Antarctica—Amundsen Sea, Antarctica—Bellingshausen Sea

53-3007

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Cripps, G.C., Hill, H.J., *Deep-sea research I*, Aug. 1998, 45(8), p.1357-1381, 51 refs.

Ice edge, Ice water interface, Ice cover effect, Marine biology, Algae, Biomass, Nutrient cycle, Antarctica—Bellingshausen Sea

53-3008

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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Spaceborne photography, Radiometry, Image processing

## 53-3009

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Taiga, Forest canopy, Vegetation patterns, Terrain identification, Biomass, Spaceborne photography, Synthetic aperture radar, Image processing, Finland—Sodankylä

## 53-3010

**Mapping snow water equivalent by combining a spatially distributed snow hydrology model with passive microwave remote-sensing data.**

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## 53-3011

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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Ice edge, Synthetic aperture radar, Radiometry, Backscattering, Spaceborne photography, Beaufort Sea

## 53-3012

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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Spaceborne photography, Synthetic aperture radar, Image processing, Mathematical models

## 53-3013

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Taiga, Forest canopy, Forest ecosystems, Plant ecology, Trees (plants), Moisture transfer, Moisture detection, Water content, Water balance, Aerial surveys, Synthetic aperture radar, Data processing

## 53-3014

**Multitemporal behavior of L- and C-band SAR observations of boreal forests.**

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Taiga, Forest canopy, Vegetation patterns, Biomass, Frost penetration, Spaceborne photography, Synthetic aperture radar, Backscattering, Image processing, Finland

## 53-3015

**Effects of snow crystal shape on the scattering of passive microwave radiation.**

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Snow crystal structure, Ice crystal size, Snow cover structure, Snow cover effect, Microwaves, Wave propagation, Scattering, Radiometry

## 53-3016

**Development of high-speed ice-skating rink. [Kosoku suketo rinku no kaihatu]**

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Artificial ice, Ice surface, Metal ice friction, Ice solid interface, Sliding

## 53-3017

**Carbon dioxide concentration under a seasonal snow cover occurring on a coastal plain in the central Japan. [Kisetsuteki sekisetsu chital ni okeru sekisetsu shita no CO<sub>2</sub> nodo]**

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Atmospheric composition, Carbon dioxide, Scavenging, Snow composition, Snow permeability, Snow hydrology, Snowmelt, Seepage, Geochemical cycles, Mathematical models, Japan

## 53-3018

**Estimation of snowfall, maximum snow depth and snow cover condition in Japan under global climate change. [Chikyu kankyo henka toki ni okeru kosekisetu no hendo yosoku]**

Inoue, S., Yokoyama, K., *Seppyo*, Sep. 1998, 60(5), p.367-378, In Japanese with English summary. 11 refs.

Snowfall, Snow cover distribution, Snow depth, Global warming, Computerized simulation, Japan

## 53-3019

**Superimposed ice in a cold glacier on the Tibetan Plateau. [Tebetto kogen no kanrei hyoga ni okeru uwazumihyo no kenkyu]**

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Glacier alimentation, Regelation, Glacier ice, Ice temperature, Glacial hydrology, Glacier mass balance, Glacier heat balance, China—Qinghai-Xizang Plateau

## 53-3020

**Molecular and atomic vibrations of ice—new findings at -34°C. [Kori no naka no bunshi genshi no shindo no kenkyu—-34°C no nazo o chushin toshite]**

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Ice crystal structure, Ice spectroscopy, Molecular structure, Molecular energy levels

## 53-3021

**Some more words on snow countermeasures for National Highway 17 (Part 14). [Kokudo 17-go yuki taisaku yowa (sono 14)]**

Abe, T., *Seppyo*, Sep. 1998, 60(5), p.401-404, In Japanese.

Buildings, Roofs, Snow removal, Drains, Channels (waterways), Japan

## 53-3022

**Snow cover classification of the Japanese Society of Snow and Ice. [Nihon seppyo gakkai sekisetsu bunrui]**

Japanese Society of Snow and Ice, *Seppyo*, Sep. 1998, 60(5), p.419-436, In Japanese with some tables and terms in English.

Snow morphology, Snow cover structure, Snow surveys, Terminology, Classifications

## 53-3023

**Avalanche classification of the Japanese Society of Snow and Ice. [Nihon seppyo gakkai yuki nadare bunrui]**

Japanese Society of Snow and Ice, *Seppyo*, Sep. 1998, 60(5), p.437-444, In Japanese.

Avalanches, Snow slides, Avalanche formation, Avalanche tracks, Terminology, Classifications

## 53-3024

**Comparison of a powder snow avalanche model with thermal experiments on inclined boundaries. [Ryushi fuyu samaru jikken ni yoru enkei yuki nadare ryudo moderu no kento]**

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Avalanche mechanics, Avalanche modeling, Thermal analysis, Mathematical models

## 53-3025

**Japanese automatic weather observation in Antarctica (1992-1997).**

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Polar atmospheres, Weather stations, Meteorological instruments, Anemometers, Wind velocity, Air temperature, Wind power generation, Batteries, Antarctica—Queen Maud Land

## 53-3026

**Snow pressures on the leg structures of power transmission towers. [Soden-yo tetto kyakubu ni sayo suru sekisetsu kaju ni tsuite]**

Hongo, E., *Seppyo*, Nov. 1998, 60(6), p.473-490, In Japanese with English summary. 3 refs.

Power line supports, Towers, Snow loads, Design criteria, Mathematical models

## 53-3027

**Some more words on snow countermeasures for National Highway 17 (Part 15). [Kokudo 17-go yuki taisaku yowa (sono 15)]**

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Snowstorms, Highway planning, Safety, Warning systems, Data transmission, Road maintenance, Japan

## 53-3028

**Three dimensional fine structures of bullet-type snow crystals and their growth conditions observed at Syowa Station, Antarctica. [Nankyoku Showa kichi de kansoku sareta hodan-gata sekkesho no sanjigenteki bisai kozo seicho joken]**

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Snow crystal growth, Snow crystal structure, Ice crystal replicas, Ice microstructure, Antarctica—Showa Station

## 53-3029

**Last 300-year volcanic signals recorded in an ice core from site H15, Antarctica.**

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Ice cores, Ice composition, Volcanic ash, Ice dating, Antarctica—Mizuho Plateau

## 53-3030

**Ice core drilling at Ushkovsky Ice cap, Kamchatka, Russia. [Kamuchatsuka hanto Ushukofusuki hyokan ni okeru seppyo koa kussaku]**

Shiraiwa, T., et al., *Seppyo*, Jan. 1999, 61(1), p.25-40, In Japanese with English summary. 21 refs.

Volcanoes, Mountain glaciers, Drilling, Coring, Ice cores, Core samplers, Ice composition, Ice temperature, Volcanic ash, Ice dating, Russia—Kamchatka Peninsula

## 53-3031

**Moulting and growth of the early stages of two species of antarctic calanoid copepods in relation to differences in food supply.**

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Marine biology, Plankton, Ecosystems, Biomass, Growth, Nutrient cycle, Chlorophylls, Sampling, South Georgia

## 53-3032

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Marine biology, Subpolar regions, Biomass, Bacteria, Nutrient cycle, Minerals, Sedimentation, Bottom sediment, Organic nuclei, Drill core analysis, Seasonal variations, Greenland—Young Sound

## 53-3033

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Marine biology, Ecosystems, Ecology, Nutrient cycle, Bottom sediment, Biomass, Metals, Geochemical cycles, Sampling, Chemical analysis, Antarctica—Terra Nova Bay

## 53-3034

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Colorado Avalanche Information Center, Denver, Colorado Geological Survey, June 1998, 36p.

Avalanches, Avalanche forecasting, Snowfall, Education, Safety, Warning systems, Meteorological data, Seasonal variations, United States—Colorado

## 53-3035

**On the origin and evolution of sea-ice anomalies in the Beaufort-Chukchi Sea.**

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Climatology, Subpolar regions, Sea ice distribution, Ice cover thickness, Ice edge, Drift, Salinity, Air temperature, Air ice water interaction, Seasonal variations, Wind factors, Mathematical models, Beaufort Sea, Chukchi Sea

## 53-3036

**Variations of atmospheric  $^{14}\text{C}$  concentrations over the Allerød-Younger Dryas transition.**

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Pleistocene, Paleoclimatology, Climatic changes, Atmospheric composition, Carbon isotopes, Paleocology, Glacial deposits, Ocean currents, Isotope analysis, Radioactive age determination, Geochronology, Simulation, Poland—Gościąg, Lake, Sweden—Madtjäm, Lake

## 53-3037

**Avalanche! When the snow comes tumbling down.**

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Avalanches, Safety, Survival, Avalanche forecasting, Weather forecasting, Snow accumulation

## 53-3038

**Riding out the storm.**

Ott, C., *Weatherwise*, Jan./Feb. 1999, 52(1), p.31-34.

Precipitation (meteorology), Snowstorms, Transportation, Cold weather operation, Safety, United States

## 53-3039

**On frozen pond.**

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Ponds, Ice formation, Slush, Snow hydrology, Snow ice interface, Surface structure

## 53-3040

**Ice-volume forcing of winter monsoon climate in the South China Sea.**

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Glaciation, Glacial meteorology, Ice volume, Marine deposits, Bottom sediment, Drill core analysis, Paleocology, Paleoclimatology, Atmospheric circulation, Global change, South China Sea

## 53-3041

**Glacial-interglacial variability in upwelling and bioproductivity off NW Mexico: implications for Quaternary paleoclimate.**

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Marine deposits, Bottom sediment, Quaternary deposits, Glaciation, Glacial meteorology, Glacier oscillation, Upwelling, Biomass, Global change, Paleoclimatology, Mexico

## 53-3042

**Dehydration of flocs by freezing.**

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Water treatment, Sewage treatment, Sludges, Waste disposal, Artificial freezing, Freeze drying

## 53-3043

**Comparison of two stable hydrogen isotope-ratio measurement techniques on antarctic surface-water and ice samples.**

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Ice composition, Impurities, Meltwater, Water chemistry, Isotope analysis, Antarctica

## 53-3044

**Identification of volatile and extractable chloroorganics in rain and snow.**

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Air pollution, Atmospheric composition, Scavenging, Snow composition, Snow impurities

## 53-3045

**Recent metal pollution in Agassiz Ice Cap.**

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Polar atmospheres, Atmospheric composition, Atmospheric circulation, Air pollution, Glacier ice, Ice composition, Impurities, Canada—Northwest Territories—Agassiz Ice Cap, Greenland

## 53-3046

**Precipitation features observed by Doppler radar at Tuktoyaktuk, Northwest Territories, Canada, during the Beaufort and Arctic Storms Experiment.**

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## 53-3047

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## 53-3048

**Seasonal changes in the morphology of the subglacial drainage system, Haut Glacier d'Arolla, Switzerland.**

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## 53-3049

**Origin of a bouldery diamicton, Kunlun Pass, Qinghai-Xizang Plateau, People's Republic of China: gelifluction deposit or rock glacier?**

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Geomorphology, Landforms, Periglacial processes, Mass transfer, Glacial till, Continuous permafrost, Active layer, Solifluction, Rock glaciers, Classifications, Theories, China—Kunlun Mountain Pass

## 53-3050

**On the implementation of a three-dimensional circulation model for Prince William Sound, Alaska.**

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Oceanography, Shores, Ocean currents, Velocity, Buoyancy, Hydrography, Water transport, Wind factors, Topographic effects, Simulation, Mathematical models, United States—Alaska—Prince William Sound

## 53-3051

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Oceanography, Shores, Ocean currents, Advection, Turbulent diffusion, Water transport, Wind factors, Hydrodynamics, Simulation, United States—Alaska—Prince William Sound

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Oceanography, Subpolar regions, Ocean currents, Water transport, Turbulent diffusion, Meltwater, Bottom topography, Seasonal variations, Wind factors, Hydrography, Mathematical models, Simulation, Barents Sea

## 53-3053

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## 53-3055

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## 53-3056

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## 53-3057

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Oceanography, Subpolar regions, Estuaries, Runoff, Sedimentation, Ocean currents, Water transport, Turbulent diffusion, Hydrologic cycle, Sampling, Arctic Ocean, Russia—Pechora River, Canada—Yukon Territory—Yukon River

## 53-3058

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## 53-3059

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Bridges, Piers, Ice loads, Ice pressure, Ice push, Thermal expansion

## 53-3063

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## 53-3064

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## 53-3066

**Reversible freeze-injury.**

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## 53-3071

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## 53-3078

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53-3080

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53-3082

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53-3084

**Analysis of visual data from medium scale indentation experiments at Hobson's Choice Ice Island.**

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53-3085

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53-3087

**High-resolution  $^{10}\text{Be}$  profile from deep sea sediment covering the last 70 Ka: indication for globally synchronized environmental events.**

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53-3088

**ESR age of *Portlandia arctica* shells from glacial deposits of central Latvia: an answer to a controversy on the age and genesis of their enclosing sediments.**

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53-3089

**Ventilation coefficients for falling ice crystals in the atmosphere at low-intermediate Reynolds numbers.**

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53-3090

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53-3091

**High-resolution diatom record of the palaeoclimates of East Siberia for the last 2.5 My from Lake Balkal.**

Grachev, M.A., et al, *Quaternary science reviews*, Dec. 1998, 17(12), p.1101-1106, 20 refs. Pleistocene, Paleoclimatology, Paleoclimatology, Climatic changes, Quaternary deposits, Lacustrine deposits, Biomass, Algae, Ecosystems, Drill core analysis, Microstructure, Russia—Baykal, Lake, Russia—Siberia

53-3092

**Long pollen record from Lac du Bouchet, Massif Central, France: for the period ca. 325 to 100 ka BP (OIS 9c to OIS 5e).**

Reille, M., Andrieu, V., De Beaulieu, J.L., Guenet, P., Goeury, C., *Quaternary science reviews*, Dec. 1998, 17(12), p.1107-1123, 57 refs. Pleistocene, Paleoclimatology, Climatic changes, Paleoclimatology, Paleoclimatology, Vegetation patterns, Lacustrine deposits, Quaternary deposits, Drill core analysis, Stratigraphy, Ice cores, Correlation, France—Lac du Bouchet

53-3093

**Late Quaternary detrital carbonate (DC-) layers in Baffin Bay marine sediments (67°-74°N): correlation with Heinrich events in the North Atlantic?**

Andrews, J.T., Kirby, M.E., Aksu, A., Barber, D.C., Meese, D.A., *MP 5312, Quaternary science reviews*, Dec. 1998, 17(12), p.1125-1137, Refs. p.1134-1137. Pleistocene, Quaternary deposits, Marine deposits, Marine geology, Glacier oscillation, Ice rafting, Drill core analysis, Stratigraphy, Geochronology, Radioactive age determination, Ice age theory, Canada—Northwest Territories, Atlantic Ocean, Baffin Bay Episodes of glaciation in the region north of Baffin Bay resulted in the erosion of Paleozoic carbonate outcrops in NW Greenland and the Canadian High Arctic. These events are recognized in the marine sediments of Baffin Bay (BB) as a series of detrital carbonate-rich (DC-) layers. BBDC-layers thin southward within Baffin Bay; thus, the contribution of Baffin Bay ice-rafted carbonate-rich sediments to the North Atlantic is probably slight, especially compared with sediment output from Hudson Strait during Heinrich events. The authors reexamine a series of nine piston cores from the axis of Baffin Bay and across the Davis Strait sill and provide a suite of 21 AMS  $^{14}\text{C}$  dates on foraminifera which bracket the ages of several DC-layers. The onset of the last DC event is dated in six cores and has an age of ca. 12.4 ka. In northern and central Baffin Bay a thick DC-layer occurs at around 4 m in the cores and is dated >40 ka. There were three to six DC intervening events. The youngest BBDC event (possibly a double event) lags Heinrich event 1 (H-1) off Hudson Strait, dated at 14.5 ka, but it is coeval with the pronounced warming seen in GISP2 records from the Greenland Ice Sheet during interstadial #1.

The authors hypothesize that BBDC episodes are coeval with major interstadial  $\delta^{18}\text{O}$  peaks from GISP2 and other Greenland ice core records and are caused by or associated with the advection of Atlantic Water into Baffin Bay and the subsequent rapid retreat of ice streams in the northern approaches to Baffin Bay.

53-3094

**Extent, timing, and climatic implications of glacier advances, Mount Rainier, Washington, U.S.A., at the Pleistocene/Holocene transition.**

Heine, J.T., *Quaternary science reviews*, Dec. 1998, 17(12), p.1139-1148, 48 refs.

Pleistocene, Paleoclimatology, Climatic changes, Glacial geology, Glacier oscillation, Mountain glaciers, Quaternary deposits, Lacustrine deposits, Volcanic ash, Moraines, Radioactive age determination, United States—Washington—Rainier, Mount

53-3095

**Last ice sheet in north-west Scotland: reconstruction and implications.**

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53-3096

**Continental collision and lateral escape deformation in the lower and upper crust: an example from Caledonide Svalbard.**

Lyberis, N., Manby, G., *Tectonics*, Feb. 1999, 18(1), p.40-63, Refs. p.62-63.

Pleistocene, Earth crust, Tectonics, Subpolar regions, Continental drift, Plastic deformation, Shear flow, Stratigraphy, Norway—Svalbard

53-3097

**Meteorite infall and transport in Antarctica: an analysis of icefields as accumulation surfaces.**

Benoit, P.H., Sears, D.W.G., *U.S. National Aeronautics and Space Administration. Contractor report*, 1997, NASA/CR-97-207734, 2p., N19980048382, 11 refs.

Ice sheets, Glacier flow, Glacier oscillation, Cosmic dust, Sediment transport, Geochronology, Antarctica

53-3098

**Debris/ice/tps assessment and integrated photographic analysis of shuttle mission STS-94.**

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Spacecraft, Aircraft icing, Ice detection

53-3099

**Covalency of the hydrogen bond in ice: A direct x-ray measurement.**

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Ice crystal structure, Molecular structure, Molecular energy levels, Hydrogen bonds, X ray analysis

53-3100

**Continuous Holocene glacial record inferred from proglacial lake sediments in Banff National Park, Alberta, Canada.**

Leonard, E.M., Reasoner, M.A., *Quaternary research*, Jan. 1999, 51(1), p.1-13, 42 refs.

Alpine glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Glacial lakes, Lacustrine deposits, Bottom sediment, Quaternary deposits, Drill core analysis, Paleobotany, Soil dating, Paleoclimatology, Canada—Alberta—Banff National Park

## 53-3101

**Lake-level chronology on the southern Bolivian Altiplano (18°-23°S) during late-glacial time and the early Holocene.**

Sylvestre, F., Servant, M., Servant-Vildary, S., Causse, C., Fournier, M., Ybert, J.P., *Quaternary research*, Jan. 1999, 51(1), p.54-66, 45 refs.

Lacustrine deposits, Quaternary deposits, Bottom sediment, Fossils, Radioactive age determination, Paleoclimatology, Soil dating, Geochronology, Bolivia

## 53-3102

**High-resolution marine record of climatic change in mid-latitude Chile during the last 28,000 years based on terrigenous sediment parameters.**

Lamy, F., Hebbeln, D., Wefer, G., *Quaternary research*, Jan. 1999, 51(1), p.83-93, 39 refs.

Marine geology, Marine deposits, Bottom sediment, Glaciation, Glacier oscillation, Glacial deposits, Sediment transport, Quaternary deposits, Drill core analysis, Soil dating, Paleoclimatology, Chile

## 53-3103

**Modeling and testing of permeability and transfer mechanisms in porous media during freezing. [Modélisation et expérimentation de la perméabilité et des mécanismes de transfert dans les milieux poreux au cours du gel]**

Djaballah-Masmoudi, N., Paris, Université 6 (Pierre et Marie Curie), [1997], 205p., Ph.D. thesis. In French. Numerous refs. passim.

Soil freezing, Freezing front, Soil water migration, Porous materials, Permeability, Frozen ground thermodynamics, Frozen rock strength, Frost shattering, Frost weathering, Stefan problem, Mathematical models

## 53-3104

**Characteristics of the ozone decline in the northern polar and middle latitudes during the winter spring.**

Bojkov, R.D., Balis, D.S., Zerefos, C.S., *Meteorology and atmospheric physics*, 1998, 69(1-2), p.119-135, 52 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Ozone

## 53-3105

**Laboratory tests of cable-based roof moisture detection system.**

Flanders, S.N., Yankielun, N.E., MP 5313, *Journal of architectural engineering*, Dec. 1998, 4(4), p.135-141, 7 refs.

Roofs, Leakage, Moisture detection, Moisture meters  
The authors have devised a prototype cable-based roof moisture detection and location system (U.S. Patent 5,648,724) that was tested in simulated conditions. The detection system can use a variety of principles to monitor roofing for the presence of moisture. The location system uses a metallic time-domain reflectometer (MTDR) to locate a suspected wet area by sending an electromagnetic pulse or step signal down the sensor cable and looking for reflections caused by a change in the dielectric constant surrounding the cable due to the presence of a wet area. Tests revealed the MTDR technique to be sensitive and able to locate the position of less than 1 L of water within 0.3 m over 30.5 m of cable. Where multiple regions of wetting were present along the length of the cable, it was possible to locate each boundary between wet and dry.

## 53-3106

**Repairing frost damage: walls.** Good repair guide 20, Part 2, Watford, England, Building Research Establishment Ltd. (BRE), Nov. 1998, 4p., 6 refs.

Walls, Bricks, Masonry, Mortars, Frost action, Frost resistance, Frost protection, Waterproofing, Cold weather construction

## 53-3107

**Repairing frost damage: roofing.** Good repair guide 20, Part 1, Watford, England, Building Research Establishment Ltd. (BRE), Oct. 1998, 4p., 14 refs.

Roofs, Masonry, Frost action, Frost resistance, Frost protection, Waterproofing, Cold weather construction

## 53-3108

**Alkalinity generation in snowmelt and rain runoff during short distance flow over rock.**

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Air pollution, Scavenging, Snow composition, Snow impurities, Snowmelt, Mountain soils, Weathering, Soil chemistry, Soil pollution, Water pollution, United States—Wyoming—Wind River Range

## 53-3109

**Cyclic AMP-dependent protein kinase: role in anoxia and freezing tolerance of the marine periwinkle *Littorina littorea*.**

MacDonald, J.A., Storey, K.B., *Marine biology*, 1999, 133(2), p.193-203, 54 refs.

Marine biology, Animals, Cryobiology, Cold exposure, Physiological effects, Cold tolerance, Acclimatization

## 53-3110

**Testing of various types of bituminous mixtures in connection with a revision of the road standard for hot mix asphalt. [Fællesafprøvning af diverse asfalttyper i forbindelse med revision af vejregel for varmblandet asfalt]**

Raaberg, J., Andersson, O.G., Nielsen, O.J., *Denmark. Vejteknisk Institut (Road Institute). Eksternt notat*, 1998, No.8, 46p. + appends., In Danish with English summary.

Pavements, Bitumens, Bearing tests, Hardness tests, Trafficability, Road maintenance, Standards, Highway planning, Denmark

## 53-3111

**Pavement subgrade performance study. Part II: modeling pavement response and predicting pavement performance.**

Zhang, W., Ullidtz, P., Macdonald, R., *Danish Road Institute. Report*, 1998, No.87, 135p. + append., 10 refs.

Pavements, Subgrade soils, Soil trafficability, Strain tests, Hardness tests, Bearing tests, Impact tests, Subgrade maintenance, Road maintenance

## 53-3112

**Emissions from road traffic in the various regions of the Swedish National Road Administration: development with and without the optimal usage of engine heaters. [Avgasutsläpp från vägtrafiken i Vägarverkets regioner: utveckling utan, alternativt med, optimal användning av motorvärmare]**

Hammarström, U., Sweden. *Statens Väg och Transportforskningsinstitut (National Road and Transport Research Institute). VTI meddelande*, 1998, No.846, 47p. + appends., In Swedish with English summary. 17 refs.

Motor vehicles, Engine starters, Electric heating, Cold weather performance, Cold weather operation, Air pollution, Environmental protection, Health, Cost analysis, Sweden

## 53-3113

**Conditions of producing an ice layer with high purity for freeze wastewater treatment.**

Shirai, Y., Wakisaka, M., Miyawaki, O., Sakashita, S., *Journal of food engineering*, 1998(Pub. 1999), No.38, p.297-308, 12 refs.

Water treatment, Waste treatment, Artificial freezing, Artificial ice

## 53-3114

**Composite materials for civil engineering structures.** MP 5314, U.S. Army Corps of Engineers.

*Engineer technical letter*, Mar. 31, 1997, ETL 1110-2-548, Var. p., 45 refs. Chapter 6: Durability, by P.K. Dutta.

Composite materials, Plastics, Polymers, Construction materials, Reinforced concretes, Concrete strength, Concrete durability, Strain tests, Structural analysis, Design criteria

## 53-3115

**Overview of the SHEBA atmospheric surface flux program.**

Andreas, E.L., Fairall, C.W., Guest, P.S., Persson, P.O.G., MP 5315, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.411-416, 10 refs.

Research projects, Drift stations, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Air ice water interaction, Ice cover effect, Ice heat flux, Heat balance

## 53-3116

**Winter flounder "antifreeze" proteins: synthesis and ice growth inhibition of analogues that probe the relative importance of hydrophobic and hydrogen-bonding interactions.**

Haymet, A.D.J., Ward, L.G., Harding, M.M., *American Chemical Society. Journal*, Feb. 10, 1999, 121(5), p.941-948, 52 refs.

Antifreezes, Chemical ice prevention, Physiological effects, Cryobiology, Molecular structure, Hydrogen bonds

## 53-3117

**Mineral assessment of Ahtna, Inc. selections in the Wrangell-St. Elias National Park and Preserve, Alaska. 1998 preliminary report.**

Meyer, M.P., VandeWeg, D.A., U.S. Bureau of Land Management. *Alaska State Office, Anchorage. BLM-Alaska open file report*, Mar. 1999, No.72, 155p. + fold. maps, Refs. passim.

Geological surveys, Exploration, Geochemistry, Minerals, Natural resources, Mining, Economic development, United States—Alaska—Wrangell-St. Elias National Park and Preserve

## 53-3118

**Use of resistivity and EM techniques to map subsidence fractures in glacial drift.**

Carpenter, P.J., *Environmental & engineering geoscience*, Winter 1997, 3(4), p.523-536, 30 refs.  
Geophysical surveys, Engineering geology, Site surveys, Glacial deposits, Glacial till, Lacustrine deposits, Soil strength, Mine shafts, Subsidence, Electromagnetic prospecting, Subsurface investigations, United States—Illinois

## 53-3119

**Holocene carbon-cycle dynamics based on CO<sub>2</sub> trapped in ice at Taylor Dome, Antarctica.**

Indermühle, A., et al, *Nature*, Mar. 11, 1999, Vol.398, p.121-126, 48 refs.

Atmospheric composition, Carbon dioxide, Ice cores, Ice composition, Isotope analysis, Geochemical cycles, Paleoclimatology, Global change, Antarctica—Taylor Dome

## 53-3120

**Study of the MSA, nssSO<sub>4</sub><sup>2-</sup> concentration and MSA to nssSO<sub>4</sub><sup>2-</sup> ratio in the snow/ice and atmospheric aerosols of the region surrounding Weddell Sea. [Nanji Welde hai zhoublan xue bing he daqi qirongjiao zhongde MSA, nssSO<sub>4</sub><sup>2-</sup> nongdu ji qi bilu yanjiu]**

Han, J.K., *Chinese journal of polar research (Jidi yanjiu)*, Dec. 1998, 10(4), p.241-251, In Chinese with English summary. 18 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Aerosols, Air pollution, Scavenging, Snow composition, Ice composition, Impurities, Nutrient cycle, Ice cores, Antarctica—Weddell Sea

## 53-3121

**Geochemical characteristics and its climatic significance in the borecore AB-32 from Ikroavik Lake in the tundra Barrow, arctic Alaska. [Bei Ji Baluo talyuanqu hupo chenji de diqlu huaxue tezhenq ji qi qihou ytl]**

Yang, W.L., Zhang, Q.S., *Chinese journal of polar research (Jidi yanjiu)*, Dec. 1998, 10(4), p.252-261, In Chinese with English summary. 23 refs.

Polar atmospheres, Tundra climate, Thermokarst lakes, Lacustrine deposits, Hydrogeochemistry, Geochemistry, Soil composition, Drill core analysis, Core samplers, Soil dating, Climatic changes, United States—Alaska—Barrow

53-3122

Human impacts on the environment of Fildes Peninsula of King George Island, Antarctica. [Renlei huodong dui Nanji Qiaozhi wang dao Feierdesi bandao huanjing de yingxiang]

Zhao, Y., Li, T.J., Zhao, J.L., *Chinese journal of polar research (Jidi yanjiu)*, Dec. 1998, 10(4), p.262-271, In Chinese with English summary. 25 refs.

Plant ecology, Vegetation patterns, Soil pollution, Water pollution, Human factors, Environmental impact, Antarctica—Fildes Peninsula

53-3123

Observations on the spore morphology of four species mosses from Fildes Peninsula, Antarctica. [Nanji Feierdesi bandao si zhong xianlei baozi xingtai guancha]

Du, G.S., Li, X.D., Liu, J.X., Wang, H.J., *Chinese journal of polar research (Jidi yanjiu)*, Dec. 1998, 10(4), p.310-312, In Chinese with English summary. 6 refs.

Mosses, Palynology, Plant ecology, Plants (botany), Vegetation patterns, Antarctica—Fildes Peninsula

53-3124

<sup>40</sup>Ar-<sup>39</sup>Ar ages of hornblendes in Grt-Pl-bearing amphibolite from the Larsemann Hills, East Antarctica and their geological implications. [Dong Nanji Lasiman qiuling shiliu xiechang jiaoshan-yan zhong jiaoshanshi de <sup>40</sup>Ar-<sup>39</sup>Ar nianling ji qi dizhi yiyi]

Tong, L.X., et al, *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.161-171, In Chinese with English summary. 39 refs. For English version see 53-3132.

Mineralogy, Lithology, Geologic structures, Tectonics, Geomorphology, Geochemistry, Geochronology, Radioactive age determination, Soil dating, Antarctica—Larsemann Hills

53-3125

Characteristics of major ion concentrations in snowpits in Longyearbyen, Svalbard, Arctic. [Bei Ji Svalbard qundao Longyearbyen diqu xuekeng zhuyao yin yang lizi tezhen yanjiu]

Kang, S.C., Qin, D.H., Ren, J.W., Gjessing, Y., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.172-180, In Chinese with English summary. 23 refs. For English version see 53-3135.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Snow samplers, Ion density (concentration), Norway—Spitsbergen

53-3126

Sedimentary process analysis of AB-67 drilling core in Barrow, Alaska. [Bei Ji Baluo AB-67 zuankong yanxin de chenji guocheng fenxi]

Wang, G., Zhang, Q.S., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.181-190, In Chinese with English summary. 9 refs.

Marine geology, Marine deposits, Lacustrine deposits, Bottom sediment, Drill core analysis, Core samplers, Soil composition, Geochemistry, Grain size, Particle size distribution, United States—Alaska—Barrow

53-3127

Distribution of snow algae at King George Island, Antarctica with reference to physical and chemical characters of snow. [Nanji Qiaozhi Wangdao xuezhao de fenbu ji qi xiangguan de xue wuli he huaxue tezhen]

Ohtani, S., Chen, B., Nakatsubo, T., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.191-203, In Chinese with English summary. 21 refs.

Algae, Plant ecology, Vegetation patterns, Cryobiology, Snow composition, Snow cover effect, Snowmelt, Water chemistry, Antarctica—King George Island

53-3128

Depletion of nutrients and the estimate of the new production in the ice-edge in Prydz Bay, Antarctica. [Nanji Pulizi wan yingyang yan xiaohao ji xin shengchanli de gusuan]

Chen, Z.Q., Wang, Y.H., Liu, J.D., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.204-211, In Chinese with English summary. 17 refs. For English version see 53-3139.

Ice edge, Ice water interface, Ice cover effect, Marine biology, Sea water, Water chemistry, Suspended sediments, Nutrient cycle, Geochemical cycles, Biomass, Antarctica—Prydz Bay

53-3129

Content of COD<sub>Mn</sub> of the Great Wall Bay and adjacent sea areas, Antarctica. [Nanji Maikesi-weier wan ji linjin haiyu gaomengsuanjia zhishu yanjiu]

Yuan, J.F., Chen, H.W., Li, Y.Q., Wu, B.L., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.212-216, In Chinese with English summary. 7 refs.

Sea water, Water chemistry, Water pollution, Ocean environments, Environmental impact, Antarctica—Maxwell Bay

53-3130

SEM studies on the plant morphology of *Schistidium* Brid. from Fildes Peninsula, Antarctica. [Nanji Feierdesi bandao liechi xianshu zhiwu de yanjiu]

Liu, J.X., Li, X.D., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.217-221, In Chinese with English summary. 5 refs.

Mosses, Vegetation patterns, Plant ecology, Plants (botany), Scanning electron microscopy, Antarctica—Fildes Peninsula

53-3131

Solid electrical conductivity measurement of polar ice cores and its environmental significance. [Jidi bingxin guti zhiiliu daodian texing jiance (ECM) ji huanjing yiyi]

Sun, B., Yao, T.D., Kang, J.C., Wen, J.H., *Chinese journal of polar research (Jidi yanjiu)*, Sep. 1998, 10(3), p.235-240, In Chinese with English summary. 25 refs.

Ice cores, Ice composition, Ice electrical properties, Ice dating, Core samplers, Drill core analysis, Electrical logging, Paleoclimatology

53-3132

<sup>40</sup>Ar-<sup>39</sup>Ar ages of hornblendes in Grt-Pl-bearing amphibolite from the Larsemann Hills, East Antarctica and their geological implications.

Tong, L.X., et al, *Chinese journal of polar science*, Dec. 1998, 9(2), p.79-91, 38 refs.

Mineralogy, Lithology, Geologic structures, Tectonics, Geomorphology, Geochemistry, Geochronology, Radioactive age determination, Soil dating, Antarctica—Larsemann Hills

53-3133

Carbon cycle in the arctic terrestrial ecosystems in relation to the global warming.

Fang, J.Y., Fei, S.L., *Chinese journal of polar science*, Dec. 1998, 9(2), p.92-100, 42 refs.

Polar atmospheres, Atmospheric composition, Soil air interface, Nutrient cycle, Geochemical cycles, Biomass, Global warming, Paleoclimatology

53-3134

Analysis of sedimentary environment of core AB-67 at Barrow.

Wang, G., Zhang, Q.S., Li, Y.F., *Chinese journal of polar science*, Dec. 1998, 9(2), p.101-108, 13 refs.

Marine geology, Sea level, Marine deposits, Lacustrine deposits, Bottom sediment, Drill core analysis, Core samplers, Soil dating, Climatic changes, Statistical analysis, United States—Alaska—Barrow

53-3135

Characteristics of ion concentrations in snowpits in Longyearbyen, Svalbard, Arctic.

Kang, S.C., Qin, D.H., Ren, J.W., Gjessing, Y., *Chinese journal of polar science*, Dec. 1998, 9(2), p.109-117, 24 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Snow samplers, Ion density (concentration), Norway—Spitsbergen

53-3136

Extraction of elevation information of ice-sheet surface on south area of the Larsemann Hills in East Antarctica.

Sun, J.B., Liu, J.L., Liu, L.M., Sun, Z.H., *Chinese journal of polar science*, Dec. 1998, 9(2), p.118-124, 5 refs.

Glacier surveys, Ice sheets, Glacier surfaces, Height finding, Topographic surveys, Infrared mapping, Radiometry, Spaceborne photography, Image processing, Statistical analysis, Antarctica—Larsemann Hills

53-3137

Late Palaeogene palynoflora from Point Hennequin of the Admiralty Bay, King George Island, Antarctica with reference to its stratigraphical significance.

Duan, W.W., Cao, L., *Chinese journal of polar science*, Dec. 1998, 9(2), p.125-132, 16 refs.

Paleobotany, Plant ecology, Vegetation patterns, Fossils, Palynology, Soil dating, Stratigraphy, Paleoclimatology, Antarctica—Hennequin, Point

53-3138

Ecology features of coastal saline lakes related to environmental evolution in the area of antarctic continental edge.

Wang, Z.P., Deprez, P., *Chinese journal of polar science*, Dec. 1998, 9(2), p.133-140, 20 refs.

Marine geology, Sea level, Glaciation, Ice sheets, Glacier oscillation, Isostasy, Salt lakes, Limnology, Ecosystems, Ecology, Lake water, Salinity, Water chemistry, Paleoclimatology, Global change, Antarctica—Vestfold Hills

53-3139

Depletion of nutrients and the estimation of the new production in the ice-edge of the Prydz Bay, Antarctica.

Chen, Z.Q., Wang, Y.H., Liu, J.D., *Chinese journal of polar science*, Dec. 1998, 9(2), p.141-148, 17 refs. Ice edge, Ice water interface, Ice cover effect, Marine biology, Sea water, Water chemistry, Suspended sediments, Nutrient cycle, Geochemical cycles, Biomass, Antarctica—Prydz Bay

53-3140

Impact of the formation and ablation of antarctic ice sheet on global geoid and sea level.

Zhang, C.J., Lu, Y., *Chinese journal of polar science*, Dec. 1998, 9(2), p.149-153, 6 refs.

Ice sheets, Glaciation, Glacier oscillation, Earth crust, Geodesy, Isostasy, Sea level, Global change, Mathematical models, Antarctica

53-3141

Three species of bryophytes from the Fildes Peninsula of Antarctica under the observation of SEM.

Liu, J.X., Li, X.D., Chen, F.D., *Chinese journal of polar science*, Dec. 1998, 9(2), p.154-156, 5 refs.

Mosses, Vegetation patterns, Plant ecology, Plants (botany), Scanning electron microscopy, Antarctica—Fildes Peninsula

53-3142

Characteristic features of vertical ozone distribution in eastern Siberia in winter-spring of 1994-1996.

Dorokhov, V.M., Zaitsev, I.G., Potapova, T.E., Khattatov, B.U., Iushkov, V.A., *Russian meteorology and hydrology*, 1998, No.4, p.31-41, Translated from *Meteorologiya i gidrologiya*. 27 refs.

Climatology, Polar atmospheres, Atmospheric composition, Ozone, Aerosols, Degradation, Seasonal variations, Sounding, Profiles, Russia—Siberia

53-3143

**Estimation of rate of dense cold water formation on the northern shelf of the Sea of Okhotsk.**

Gladyshev, S.V., *Russian meteorology and hydrology*, 1998, No.4, p.53-59, Translated from *Meteorologiya i gidrologiya*. 18 refs.

Oceanography, Subpolar regions, Polynyas, Ice volume, Ice formation, Brines, Salinity, Water structure, Ocean bottom, Stratification, Okhotsk Sea

53-3144

**Mathematical modelling of pollution dynamics in river basins of the arctic zone of Russia.**

Vinogradova, T.A., Vinogradov, I.U.B., *Russian meteorology and hydrology*, 1998, No.4, p.72-80, Translated from *Meteorologiya i gidrologiya*. 2 refs.

River basins, Subpolar regions, Runoff, Water pollution, Soil pollution, Snow impurities, Spacecraft, Fuels, Wastes, Adsorption, Absorption, Mathematical models, Russia—Sula River

53-3145

**Temperature trends in the lower stratosphere of the Arctic.**

Koshel'kov, I.U.P., Zakharov, G.R., *Soviet meteorology and hydrology*, 1998, No.5, p.29-36, Translated from *Meteorologiya i gidrologiya*. 10 refs.

Climatology, Polar atmospheres, Stratosphere, Air temperature, Radio echo soundings, Seasonal variations, Statistical analysis

53-3146

**Statistical modeling of ridge height distribution.**

Gudoshnikov, I.U.P., Kolesov, S.A., Naumov, A.K., *Soviet meteorology and hydrology*, 1998, No.5, p.45-49, Translated from *Meteorologiya i gidrologiya*. 9 refs.

Sea ice, Ice cover thickness, Surface structure, Topographic features, Pressure ridges, Distribution, Ice bottom surface, Photogrammetry, Stereophotography, Statistical analysis, Mathematical models, Russia—Pechora Bay

53-3147

**Estimation of influence of global warming on ice appearance and breakup dates on rivers based on joint use of ice and water regime models.**

Borshch, S.V., Ginzburg, M.M., Soldatova, I.I., *Soviet meteorology and hydrology*, 1998, No.5, p.57-62, Translated from *Meteorologiya i gidrologiya*. 14 refs.

Climatology, Climatic changes, Global warming, River ice, Seasonal freeze thaw, Freezep, Ice breakup, Runoff, Air temperature, Ice air interface, Temperature effects, Forecasting, Analysis (mathematics)

53-3148

**Thermohaline structure of bottom water on the northern Okhotsk Sea shelf.**

Gladyshev, S.V., *Russian meteorology and hydrology*, 1998, No.3, p.39-46, Translated from *Meteorologiya i gidrologiya*. 22 refs.

Oceanography, Subpolar regions, Polynyas, Ocean bottom, Ocean currents, Water structure, Brines, Salinity, Stratification, Profiles, Statistical analysis, Okhotsk Sea

53-3149

**Role of boundary dynamic processes in the change of ice concentration in arctic seas in summer.**

Gudkovich, Z.M., Zakharov, V.F., *Russian meteorology and hydrology*, 1998, No.3, p.47-52, Translated from *Meteorologiya i gidrologiya*. 16 refs.

Oceanography, Subpolar regions, Sea ice distribution, Drift, Ice edge, Sea level, Seasonal variations, Mathematical models, Indexes (ratios), Arctic Ocean

53-3150

**Mechanism of brine migration in sea ice.**

Bogorodskii, P.V., *Russian meteorology and hydrology*, 1998, No.3, p.53-60, Translated from *Meteorologiya i gidrologiya*. 16 refs.

Oceanography, Sea ice, Ice structure, Ice water interface, Brines, Migration, Convection, Thermal diffusion, Permeability, Mathematical models

53-3151

**Mesoscale model simulation of the 4-5 January 1995 lake-effect snowstorm.**

Ballentine, R.J., Stamm, A.J., Chermack, E.E., Byrd, G.P., Schleede, D., *Weather and forecasting*, Dec. 1998, 13(4), p.893-920, 38 refs.

Precipitation (meteorology), Snowstorms, Snowfall, Fronts (meteorology), Lake effects, Moisture transfer, Advection, Synoptic meteorology, Models, Simulation, Weather forecasting, United States—Huron, Lake, United States—New York

53-3152

**Statistical characteristics of a real-time precipitation forecasting model.**

Gaudet, B., Cotton, W.R., *Weather and forecasting*, Dec. 1998, 13(4), p.966-982, 45 refs.

Climatology, Precipitation (meteorology), Snowfall, Distribution, Cloud physics, Classifications, Mountains, Topographic effects, Mathematical models, Weather forecasting, Statistical analysis, United States—Colorado

53-3153

**Evaluation of WSR-88D severe hail algorithms along the northeastern Gulf Coast.**

Lenning, E., Fuelberg, H.E., Watson, A.I., *Weather and forecasting*, Dec. 1998, 13(4), p.1029-1044, 28 refs.

Climatology, Precipitation (meteorology), Weather forecasting, Thunderstorms, Freezing points, Hail, Detection, Indexes (ratios), Radar echoes, Computer programs, Data processing, Performance, United States—Florida

53-3154

**Steadman wind chill: an improvement over present scales.**

Quayle, R.G., Steadman, R.G., *Weather and forecasting*, Dec. 1998, 13(4), p.1187-1193, 22 refs.

Climatology, Air temperature, Indexes (ratios), Wind chill, Statistical analysis, Accuracy

53-3155

**Palaeoecological, biogeographical and palaeoclimatological implications of early Holocene immigration of *Larix sibirica* Ledeb. into the Scandes Mountains, Sweden.**

Kullman, L., *Global ecology and biogeography letters*, May 1998, 7(3), p.181-188, 56 refs.

Paleoecology, Paleoclimatology, Biogeography, Subarctic landscapes, Forest lines, Vegetation patterns, Migration, Sediments, Quaternary deposits, Stratigraphy, Radioactive age determination, Geochronology, Sweden—Scandes Mountains

53-3156

**Vibrational dynamics of amorphous ice.**

Kolesnikov, A.I., Li, J.C., Parker, S.F., Eccleston, R.S., Loong, C.K., *Physical review B*, Feb. 1, 1999, 59(5), p.3569-3578, 56 refs.

Ice physics, Amorphous ice, Ice formation, Classifications, Ice density, Molecular energy levels, Vibration, Molecular structure, Spectra, Neutron scattering, Ice spectroscopy

53-3157

**Molecular dynamics simulation of polarizable ice adlayers on MgO(100).**

Soetens, J.C., Millot, C., Hoang, P.N.M., Girardet, C., *Surface science*, Dec. 24, 1998, 419(1), p.48-61, 24 refs.

Ice crystal structure, Ice adhesion, Water structure, Water films, Molecular structure, Molecular energy levels, Monomolecular films, Hydrogen bonds, Adsorption, Polarization (charge separation)

53-3158

**Cyanide and metal pollution by urban snowmelt: Impact of deicing compounds.**

Novotny, V., Muehring, D., Zitomer, D.H., Smith, D.W., Facey, R., *Water science & technology*, Nov. 1998, 38(10), 19th Biennial Conference of the International Association on Water Quality, Vancouver, BC, Canada, June 21-26, 1998. Selected Proceedings, Pt.8, p.223-230, 14 refs.

Chemical ice prevention, Salting, Snow composition, Snow impurities, Snowmelt, Water pollution, Environmental impact, Health

53-3159

**Annual report 1998.**

National Snow and Ice Data Center. World Data Center-A for Glaciology, Boulder, University of Colorado, 1998, 38p., 54 refs.

Snow surveys, Ice surveys, Glacier surveys, Research projects, Organizations, Data processing

53-3160

**Medium-scale indentation tests on sea ice at various speeds.**

Sodhi, D.S., Takeuchi, T., Nakazawa, N., Akagawa, S., Saeki, H., MP 5316, *Cold regions science and technology*, 1998, 28(3), p.161-182, 74 refs.

Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover strength, Ice deformation, Ice creep, Ice breaking, Strain tests, Penetration tests

As part of a five-year program involving laboratory and field tests in Japan, the authors conducted medium-scale indentation tests on sea ice in the harbor of Lake Noto, Hokkaido, by pushing a segmented indenter against the edge of a floating ice sheet. Measurements on each 10-cm wide segment included forces in three directions and the moment about a horizontal line parallel to the indenter face. During the tests in 1998, the authors also installed four pressure-sensing panels on the face of the segmented indenter and measured interfacial pressure during indentation tests at three speeds. They present the results from the load cells and the pressure-sensing panels. They obtained data on the actual contact area and the magnitude of interfacial pressures from the pressure-sensing panels. They observed both a 'line-like' contact during high-speed (3- and 30-mm/s) indentation tests, and a gradually enlarging contact area attributable to creep deformation of the ice during low-speed (0.3-mm/s) indentation tests. Using the results of a brittle flaking model from the literature, the authors estimate the apparent fracture toughness of the ice from the data on interfacial pressure and the width of the contact area. Taking creep and fracture properties into account, they present a theoretical model to estimate the speed at which the transition from ductile to brittle failure of ice takes place during ice-structure interaction.

53-3161

**Hypothermia—cold-induced injuries.** [Stockholm], Sweden, Socialstyrelsen (National Board of Health and Welfare), 1997, 110p., Refs. p.65-80.

Cold exposure, Physiological effects, Health, Cold weather survival

53-3162

**Annual report 1997.**

Colorado. University. Institute of Arctic and Alpine Research (INSTAAR), Boulder, University of Colorado, [1998], 44p., Refs. passim.

Organizations, Research projects, Education, Cost analysis

53-3163

**Birch Creek National Wild River, Alaska: resource values and instream flow recommendations.**

Sterin, B.G., Whittaker, D., Kostohrys, J., U.S. Bureau of Land Management. *Alaska State Office, Anchorage. [Report]*, Dec. 1998, BLM/AK/ST-98/002, 76p., Refs. p.45-50, 61.

Stream flow, River flow, Flow control, Channel stabilization, Natural resources, Ecology, Ecosystems, Environmental protection, United States—Alaska—Birch Creek

53-3164

**Annual report 1997. [Jahresbericht 1997]**

Bundesamt für Seeschifffahrt und Hydrographie (BSH. Federal Maritime and Hydrographic Agency), Hamburg, 1998, 226p., In German with English summary. Refs. passim.

Organizations, Research projects, Oceanographic surveys, Ships, Marine transportation, Economic development, Environmental protection, Route surveys, Weather forecasting, Ice forecasting, Ice reporting, Safety, Data processing, Data transmission, Cost analysis, Germany, North Sea, Baltic Sea

53-3165

**Formation of a jump by the dam-break wave over a granular bed.**

Capart, H., Young, D.L., *Journal of fluid mechanics*, Oct. 10, 1998, Vol.372, p.165-187, 58 refs.

Dams, Floods, Mudflows, Sediment transport, Water waves, Shock waves, Water flow, Unsteady flow, Turbulent flow, Hydrodynamics, Mathematical models

## 53-3166

Activity and experience report on the avalanche warning service in Bavaria, winter 1997/1998. [Tätigkeits- und Erfahrungsbericht über den Lawinenwarndienst in Bayern, Winter 1997/1998]. Munich, Bayerisches Landesamt für Wasserwirtschaft (Bavarian Regional Office for Water Management), 1998, 100p., In German.

Snow surveys, Snow depth, Weather forecasting, Avalanches, Accidents, Avalanche forecasting, Safety, Germany

## 53-3167

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Extraterrestrial ice, Planetary environments, Satellites (natural), Cosmic dust, Mass transfer, Ground ice, Ice detection, Water transport, Origin, Impact, Mathematical models, Statistical analysis, Theories

## 53-3168

Monte Carlo model for the flow of dust in a porous comet nucleus.

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Extraterrestrial ice, Ice physics, Satellites (natural), Porosity, Dust, Ice vapor interface, Particles, Ice sublimation, Vapor diffusion, Mathematical models, Fluid dynamics, Simulation

## 53-3169

Regression of Martian north polar cap: 1990-1997 Hubble Space Telescope observations.

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Mars (planet), Extraterrestrial ice, Carbon dioxide, Ice sheets, Ice edge, Ice sublimation, Spaceborne photography, Polar regions, Albedo, Seasonal variations, Image processing

## 53-3170

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Satellites (natural), Extraterrestrial ice, Regolith, Magma, Ice physics, Radiation absorption, Ice composition, Dielectric properties, Solutions, Simulation, Cryogenics, Remote sensing, Electrical measurement

## 53-3171

Upper limits for condensed O<sub>2</sub> on Saturn's icy satellites and rings.

Spencer, J., *Icarus*, Dec. 1998, 136(2), p.349-352, 23 refs.

Extraterrestrial ice, Satellites (natural), Regolith, Oxygen, Condensation, Ice physics, Ice sublimation, Photochemical reactions, Radiation absorption, Ice spectroscopy, Spectra, Theories

## 53-3172

Preservation of biomolecules in sub-fossil plants from raised peat bogs—a potential paleoenvironmental proxy.

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Soil chemistry, Paleobotany, Paleoecology, Peat, Wetlands, Organic soils, Soil formation, Diagenesis, Degradation, Geochemistry, Drill core analysis, Stratigraphy, Poland

## 53-3173

Origins and fate of dissolved sterols in the Weddell Sea, Antarctica.

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Oceanography, Geochemical cycles, Ocean bottom, Sea water, Hydrocarbons, Ecology, Particles, Solubility, Degradation, Distribution, Classifications, Spectroscopy, Antarctica—Weddell Sea

## 53-3174

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Pleistocene, Hydrocarbons, Earth crust, Subpolar regions, Coal, Classifications, Geochemistry, Palynology, Lithology, Exploration, Sampling, Chemical analysis, Canada—Northwest Territories—Ellesmere Island

## 53-3175

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Paleoecology, Forest ecosystems, Limnology, Hydrogeochemistry, Lake water, Chemical properties, Forest fires, Hydrocarbons, Lacustrine deposits, Palynology, Drill core analysis, Environmental tests, Sweden—Makkassjön

## 53-3176

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Bridges, Winter maintenance, Concrete pavements, Concrete durability, Concrete admixtures, Cracking (fracturing), Frost resistance, Freeze thaw cycles, Freeze thaw tests, Salt water, Seepage, Profiles

## 53-3177

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## 53-3178

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Pleistocene, Marine geology, Tectonics, Subpolar regions, Earth crust, Subsidence, Isostasy, Shear stress, Seismic reflection, Mathematical models, Beaufort Sea

## 53-3179

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Plant physiology, Plant ecology, Frost protection, Protective coatings, Chemical composition, Thermal insulation, Thermal conductivity, Stability, Mathematical models, Simulation

## 53-3180

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Oceanography, Oil spills, Subpolar regions, Shores, Ocean currents, Wind direction, Advection, Air water interactions, Forecasting, Environmental protection, United States—Alaska—Prince William Sound

## 53-3181

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Sellier, D., Lawson, T.J., *Scottish geographical magazine*, Aug. 1998, 114(2), p.85-93, 30 refs.

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## 53-3182

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## 53-3183

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Air pollution, Dust, Aerosols, Sedimentation, Snow impurities, Ice sheets, Metals, Fuel additives, Sampling, Theories, Origin, Environmental tests, Greenland

## 53-3184

Mineralogical fingerprints of industrial emissions—an example from Ni mining and smelting on the Kola Peninsula, NW Russia.

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Air pollution, Polar atmospheres, Snow impurities, Snow composition, Aerosols, Particles, Metals, Mining, Mineralogy, Chemical analysis, Environmental tests, Russia—Kola Peninsula

## 53-3185

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Banks, D., Sletten, R.S., Haldorsen, S., Dale, B., Heim, M., Swensen, B., *Geothermics*, Aug. 1998, 27(4), p.445-467, 28 refs.

Geothermy, Subpolar regions, Hot springs, Hydrogeology, Hydrogeochemistry, Underwater geothermal measurement, Ion density (concentration), Chemical analysis, Norway—Svalbard

## 53-3186

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Hydrogeology, Glacial geology, Ice push, Tectonics, Earth crust, Quaternary deposits, Deformation, Glacier ice, Ice melting, Radar echoes, Sensor mapping, Profiles, United Kingdom—Sellafield District

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Aircraft icing, Ice forecasting, Cloud physics, Supercooled clouds, Cloud droplets, Ice crystal size, Unfrozen water content, Weather forecasting, Safety



## 53-3188

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## 53-3189

**Planning considerations for winter sports resort development.**  
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## 53-3190

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## 53-3191

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## 53-3192

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## 53-3193

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## 53-3194

**Covalent HCl at the surface of crystalline ice at 125 K: the stable phase at submonolayer levels.**  
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## 53-3195

**Reproductive success of lake herring in habitats near shipping channels and ice-breaking operation in the St. Marys River, Michigan, USA.**  
Blouin, M.A., Kostich, M.M., Todd, T.N., Savino, J.F., *Archiv für Hydrobiologie*, May 1998, Vol.50, p.15-24, 12 refs.  
River ice, Ice breaking, Ice cover effect, Environmental impact, Animals, Ecology, United States—Michigan—St. Marys River

## 53-3196

**Trace substances in snow and firn from the vicinity of two small research stations in Antarctica.**  
Stenberg, M., Eriksson, C., Heintzenberg, J., *Ambio*, Sep. 1998, 27(6), p.451-455, 34 refs.  
Atmospheric composition, Air pollution, Scavenging, Snow composition, Snow impurities, Snow samplers, Core samplers, Ion density (concentration), Antarctica—Wasa Station, Antarctica—Aboa Station

## 53-3197

**Mobilization of metal-contaminated sediment by ice-jam floods.**  
Moore, J.N., Landrigan, E.M., *Environmental geology*, Jan. 1999, 37(1-2), p.96-101, 18 refs.  
River ice, Ice jams, Ice erosion, Ice cover effect, Floods, Tailings, Soil pollution, Soil erosion, Water erosion, Suspended sediments, Water pollution, Sediment transport, Alluvium, United States—Montana—Clark Fork River, United States—Montana—Blackfoot River

## 53-3198

**British Columbia highways avalanche incident.**  
Boissoneault, M., *Avalanche review*, Mar. 1999, 17(5), p.3.  
Avalanches, Accidents, Canada—British Columbia

## 53-3199

**Explosive use for avalanche control.**  
Bachman, D., Heywood, L., *Avalanche review*, Mar. 1999, 17(5), p.6-8, 8 refs.  
Avalanche triggering, Explosives, Blasting, Safety

## 53-3200

**Unblocking of the Nares Strait by Greenland and Ellesmere ice-sheet retreat 10,000 years ago.**  
Zreda, M., England, J., Phillips, F., Elmore, D., Sharma, P., *Nature*, Mar. 11, 1999, Vol.398, p.139-142, 30 refs.  
Glaciation, Ice sheets, Glacial geology, Glacial deposits, Glacier oscillation, Marine geology, Marine deposits, Bedrock, Radioactive age determination, Geochronology, Paleoclimatology, Canada—Northwest Territories—Ellesmere Island, Greenland

## 53-3201

**Registration of "CD-II" crested wheatgrass.**  
Asay, K.H., et al, MP 5317, *Crop science*, 1997, Vol.37, p.1023, 1 ref.  
Grasses, Plants (botany), Introduced plants, Plant physiology, Plant tissues, Plant ecology, Agriculture

## 53-3202

**Coping with spatial heterogeneity effects on sampling and analysis at an HMX-contaminated anti-tank firing range.**  
Jenkins, T.F., et al, MP 5318, *Field analytical chemistry and technology*, 1999, 3(1), p.19-28, 24 refs.  
Military facilities, Site surveys, Explosives, Soil pollution, Soil tests, Soil analysis, Soil chemistry, Chemical analysis, Statistical analysis

Short-range and mid-range (grid size) spatial heterogeneity in explosives concentrations within surface soils was studied at an active anti-tank firing range. Intensive sampling was conducted adjacent to two target tanks by establishing sixteen 6 m<sup>2</sup> grids. Each grid was subdivided into four quadrants, and in each quadrant an area-integrated surface sample was formed into a pile that included about 10% of the top 5 cm of soil in the quadrant. After in situ homogenization, random aliquots were combined to form replicate representative samples. Grid composites were also prepared by combining equal portions of soil from the four quadrants for each grid. In nine of the quadrants, a second area-integrated sample was prepared. On-site analysis showed concentrations of HMX ranging from as high as 2160 mg/kg near one target to  $\leq 1$  mg/kg at a distance of 20 m from the target. TNT concentrations, ranging from  $\leq 1$  to 23 mg/kg, were much lower than would be expected based on the 70:30 composition ratio of HMX to TNT in the melt-cast explosive used on site. On-site concentration estimates for HMX and TNT were in excellent agreement with laboratory HPLC results; correlation coefficients were 0.992 and 0.975, respectively. Spatial heterogeneity of HMX concentrations was large on both short- and mid-range scales, and this factor dominated the overall uncertainty associated with site characterization. Greater emphasis on sampling is urgently needed to improve the representativeness of explosives residue determinations in soil.

## 53-3203

**Temperature and germination relationships of *Festuca* varieties.**  
Brar, G.S., Palazzo, A.J., MP 5319, *Plant varieties and seeds*, 1997, Vol.10, p.103-111, 25 refs.  
Grasses, Introduced plants, Plants (botany), Plant ecology, Plant physiology, Plant tissues, Revegetation, Soil conservation  
Many studies have shown that water potential at planting will affect the germination rate and final germination of *Festuca* varieties. Limited information is available about the extent of variability in temperature dependence of germination among different *Festuca* varieties. The objective of the authors was to study germination at five temperatures for a wide range of *Festuca* varieties. *Festuca* seeds were screened for germination during 28 days in polyethylene growth pouches held at constant temperatures of 10, 15, 20, 25 or 30°C. The germination percentage significantly ( $P < 0.05$ ) increased as the temperature increased from 10° to 15°C and decreased thereafter. The variety 'Clemfne' tall fescue (*Festuca arundinacea* Schreb.) had the greatest germination percentage and 'Arctared' red fescue (*Festuca rubra* L.) had the least when averaged across the five temperatures. Conversely the average time to germination ( $A_{50}$ ) was greatest at 10°C and least at 30°C. Reaching a germination level of 80% or more of the seeds required 14 d at 10°C, 9 d at 15°C, 8 d at 20°C and 7 d at 25°C or 30°C. Base temperatures required for germination of *Festuca* species were 3.2°C for rapid germinators, 3.6 to 6°C for medium germinators, and 4 to 6°C for slow germinators. Heat units calculated for the rapid germinators were 129°C d, 120 to 140°C for medium germinators, and 135 to 191°C d for the slow germinators. Germination decreased as heat units increased. The  $A_{50}$  and heat units regressions explained 91% and 66% of the variations in germination, respectively. The optimum temperature for germination of *Festuca* varieties was 15°C. Seeding time for some *Festuca* varieties could be varied based on expected seed zone temperatures for particular locations. Rapidity and total germination are the most obvious factors distinguishing *Festuca* varieties. This study demonstrates the variability in rate and extent of varieties germination in response to temperatures.

## 53-3204

**UXO detection at Jefferson Proving Ground using ground-penetrating radar.**  
Arcane, S.A., Delaney, A.J., Sellmann, P.V., O'Neill, K., MP 5320, UXO (Unexploded Ordnance) Forum '98, Anaheim, CA, May 5-7, 1998, Alexandria, VA, U.S. Department of Defense Explosives Safety Board, 1998, p.1-24, 23 refs.  
Military facilities, Explosives, Site surveys, Electromagnetic prospecting, Radio echo soundings, Subsurface investigations, United States—Indiana—Jefferson Proving Ground  
The authors have used ground-penetrating radar (GPR) to detect unexploded ordnance (UXO) and non-ordnance on the 40-acre site (lot 54) of Jefferson Proving Ground, IN. The UXO are buried within about 1 m deep in a clayey silt for which the soil water content ranged from moist near the surface to near saturation at about 1 m. The authors used a 16-bit radar to profile along previously established lines, and transects over artificial targets that were emplaced. Data was recorded at 48-64 traces/s with minimal towing speeds during both dry and rainy weather. Target responses at about 300 (time range of 50 ns) and 600 MHz (30 ns) ranged from discrete diffractions to short reflection segments. The loss of the soil greatly attenuated diffraction hyperbolas. Theoretical analyses of these hyperbolas give an average soil dielectric constant of 10 at both 300 and 600 MHz. The phase polarity of many of the reflected and diffracted wavelets indicate targets with wave impedances higher than that of the soil. The authors assume these targets to be metallic and the responses of some, whose locations correlate with the position of UXO on burial maps, are shown in detail. Theoretical modeling of wavelet propagation for this soil confirms the high rate of attenuation (47-66 dB/m round trip), the maintenance of waveform, a shift in wavelet local frequency, and response to a typical UXO. It is concluded that GPR is effective for finding targets in this type of soil to no more than 2 m depth. The authors recommend that future surveys utilize high trace acquisition rates to capture the full target responses and a proved, heavy dielectric antenna sled to improve antenna-to-ground coupling and deflect surface obstacles such as vegetation.

## 53-3205

**Parent-progeny relationships for carbon isotope discrimination and related characters in crested wheatgrass.**  
Asay, K.H., Johnson, D.A., Palazzo, A.J., MP 5321, *International journal of plant sciences*, 1998, 159(5), p.821-825, 25 refs.  
Grasses, Introduced plants, Plants (botany), Plant physiology, Plant tissues, Plant ecology, Revegetation, Agriculture, Soil conservation, Land reclamation  
Improved cultivars of perennial grasses developed for natural resource conservation and forage production on semiarid rangelands of western North America must persist under extreme environmental stress and make efficient use of limited water resources. A close negative relationship has been documented between carbon isotope discrimination ( $\Delta$ ) and water use efficiency (WUE) in temperate ( $C_3$ ) grasses, and preliminary evidence indicates that  $\Delta$  would be a promising indirect selection criterion to improve WUE in crested wheat-

grass, *Agropyron cristatum* (L.) Gaertner and *Agropyron desertorum* (Fisch. ex Link) Schultes, a widely used grass on semiarid rangelands. The authors determined the magnitude of genetic variability and parent-progeny relationships for  $\Delta$  and the correlation of this attribute with forage yield in a genetically broad-based crested wheatgrass breeding population. Significant differences ( $P < 0.01$ ) were found among clonal and progeny lines for  $\Delta$  of the leaves and seeds. Broad-sense heritability values for leaf and seed  $\Delta$  computed on a mean basis across two years exceeded 90%. Narrow-sense heritability for leaf  $\Delta$ , based on parent-progeny regression analysis across two years, was 60%. Broad- and narrow-sense heritability values for dry matter yield (DMY) were substantially less than the corresponding values for  $\Delta$ . The correlations between  $\Delta$  and DMY were generally low and nonsignificant. These data confirm earlier, preliminary conclusions that selection for  $\Delta$  to improve WUE would be a worthy breeding objective in crested wheatgrass and that genetic advances in  $\Delta$  and DMY could be achieved concurrently.

### 53-3206

#### Fine fescue species determination by laser flow cytometry.

Huff, D.R., Palazzo, A.J., MP 5322, *Crop science*, Mar-Apr. 1998, Vol.38, p.445-450, 34 refs.

Grasses, Plants (botany), Plant physiology, Plant tissues, Agriculture

The close morphological resemblance among fine fescues (*Festuca* spp.) makes identification and classification of species a difficult problem for turfgrass and taxonomic scientists. Determining ploidy level has become a major taxonomic tool for identifying species of fine fescues. The present study used laser flow cytometry to determine ploidy levels of 48 fine fescue populations (accessions) and thereby infer species classification based on observed and previously reported chromosome numbers. The 10 species of fine fescues examined were strong creeping red fescue (*F. rubra* L. spp. *rubra*), slender creeping red fescue (*F. rubra* var. *littoralis* Vasey), chewing fescue (*F. rubra* spp. *fallax* (Thunb.) Nyman), hard fescue (*F. brevipila* Tracey), sheep fescue (*F. ovina* L. spp. *hirtula* (Hackel ex Travis) Wilkinson), hair fescue (*F. filiformis* Pourret), false sheep fescue (*F. pseudovina* Hackel ex Wiesb.), alpine fescue (*G. brachyphylla* Schultes), bluebunch fescue (*F. idahoensis* Elmer), and tundra fescue (*F. lenensis* Drobov). Significant differences were observed between species ( $P < 0.01$ ) and among populations within species ( $P < 0.05$ ). DNA content among the 10 species was observed to be highly positively correlated with observed or reported chromosome numbers ( $r = 0.97$ ,  $n = 10$ ,  $P < 0.01$ ). Linear regression analysis predicted 2C DNA content values for each of the four ploidy levels to be 5.31 pg for diploids, 8.53 pg for tetraploids, 11.75 pg for hexaploids and 14.98 pg for octoploids. The observations and results of the present study are consistent with current taxonomic treatments of hard and sheep fescue species as well as the other fine fescue species examined. The information presented should aid breeders in accurately and easily determining primary breeding germplasm with respect to ploidy levels. It may also enable the turfgrass industry to define reliable seed products and the plant collector to begin to assign native and/or naturalized accessions to their proper species categories.

### 53-3207

#### Environmental effects on detection of buried mines and UXO.

Detsch, R.M., Jenkins, T.F., Arcone, S.A., Koh, G., O'Neill, K., MP 5323, *SPIE—The International Society for Optical Engineering. Proceedings. Part 2*, 1998, Vol.3392, Conference on Detection and Remediation Technologies for Mines and Minelike Targets III, Orlando, FL, Apr. 13-17, 1998, p.1261-1264, 4 refs.

Mines (ordnance), Explosives, Frozen ground chemistry, Chemical analysis, Snow cover effect, Radio echo soundings, Electromagnetic prospecting, Infra-red photography, Subsurface investigations

Several studies are under way at the U.S. Army Cold Regions Research and Engineering Laboratory (CRRLE) to define environmental effects on detection and classification of buried mines and unexploded ordnance (UXO). Ground that is very wet, frozen, or snow covered can pose severe constraints on demining operations. The qualitative and quantitative nature of chemical signatures of buried land mines is being documented. Research to date indicates that although 2,4,6-trinitrotoluene constitutes over 99% of military-grade TNT, it is a minor component of the vapor signature at ground level. CRRLE operates a year-round test site to determine the effect of weather on radar and IR systems used to detect buried mines. The New England site experiences many of the weather conditions likely to interfere with mine detection around the world. Short-pulse ground penetrating radar (GPR) was used to profile both ordnance and non-ordnance targets at the 40-acre UXO site at Jefferson Proving Ground. Analysis of the data indicates that future systems will have to operate at faster data acquisition rates. Radar modeling is being used to simulate the effects of the environment and identify new techniques for finding and classifying buried ferrous objects.

### 53-3208

#### Plant and microbial influence on bioremediation of hydrocarbon-contaminated soils.

Beyrouthy, C.A., Reynolds, C.M., Rogers, H.B., Nichols, T.D., Wolf, D.C., MP 5324, International Petroleum Environmental Conference, 3rd, Albuquerque, NM, Sep. 24-27, 1996. Proceedings. Vol.1, Washington, D.C., U.S. Department of Energy, [1996], p.465-474, 3 refs.

Oil spills, Soil pollution, Grasses, Roots, Plant physiology, Protective vegetation, Revegetation, Soil microbiology, Bacteria, Nutrient cycle, Land reclamation

The rhizosphere soil adjacent to the plant root exhibits high microbial activity that may enhance hydrocarbon contaminant biodegradation. The authors amended a soil with an organic contaminant mixture (OCM) containing equimolar amounts of benzoic acid, hexadecane, 2,2-dimethyl 4-n-propyl-benzene, phenanthrene, pyrene, and *cis*-decahydronaphthalene or cycloheptane to evaluate plant species that can satisfactorily grow in contaminated soils and enhance the potential for microbial decomposition of contaminants in the rhizosphere. In a plant screening of four legumes, four grasses, and one composite exposed to 0, 1000, 2000, 4000 or 8000 mg OCM/kg, plant growth was reduced at the 4000 and 8000 mg/kg rates. At 1000 and 2000 mg OCM/kg, root length and root dry weight of alpine bluegrass (*Poa alpina* L.) increased. Root growth for the remaining plant species generally decreased as OCM rate increased. These studies demonstrated that plants can germinate and grow in contaminated soil, that relative to the bulk soil there is an increase in the percentage of the rhizosphere microbial population capable of degrading contaminants, and that roots of select plants can explore contaminated soil. These data support the hypothesis that bioremediation of petroleum contaminated-soil can be enhanced by growth of appropriate plant species.

### 53-3209

#### Phytoremediation of hydrocarbon contaminated soils.

Reynolds, C.M., et al, MP 5325, International Petroleum Environmental Conference, 4th, San Antonio, TX, Sep. 9-12, 1997. Proceedings, Washington, D.C., U.S. Department of Energy, [1997], 10p., 16 refs.

Oil spills, Soil pollution, Grasses, Roots, Plant physiology, Protective vegetation, Revegetation, Soil microbiology, Bacteria, Nutrient cycle, Land reclamation

Using plants and their associated rhizosphere microorganisms to enhance biodegradation of organic contaminants may provide a viable, low-cost remediation option well-suited to remote sites or fragile ecosystems. The authors investigated changes in the microbial populations of a Captina silt loam with or without bahiagrass (*Paspalum notatum* Flugge, var. Argentine), amended with 0 or 2000 mg pyrene/kg soil, and incubated for 10 weeks. Microbial numbers were not significantly influenced by the pyrene level, but were greater in the rhizosphere compared to the bulk soil. Bacterial numbers were  $5.9 \times 10^6$  and  $3.6 \times 10^6$  CFU/g in the bulk and rhizosphere soil, respectively. The authors developed and used a "soil sock" technique in a field study to determine the effects of nutrient addition and plants on bacterial numbers and remediation of soil contaminated with diesel. Initial data from the study showed that addition of nutrients and plants together resulted in significantly higher bacterial numbers than the control and the greatest decrease in total petroleum hydrocarbon (TPH) levels. An Annual ryegrass (*Lolium multiflorum*, Lam.) and Arctic red fescue (*Festuca rubra* L.) mixture was effective in reducing TPH levels. These studies have demonstrated plant germination and growth in hydrocarbon-contaminated soil, the importance of rhizosphere microbial populations in pyrene degradation, and plants and nutrient stimulation of TPH biodegradation in the field. These data support the use of phytoremediation of hydrocarbon-contaminated soils as a technology especially well-suited to remote sites and fragile ecosystems.

### 53-3210

#### Remote sensing of DMSP SSM/I over the South China Sea and retrieval algorithm of sea surface wind speeds.

Jin, Y.Q., *Chinese journal of geophysics*, 1998, 41(1), p.29-37, 5 refs.

Oceanographic surveys, Marine atmospheres, Air water interactions, Wind velocity, Sea states, Surface temperature, Radiometry, Radio echo soundings, Spaceborne photography, Mathematical models, South China Sea

### 53-3211

#### Decomposition of tree root litter in a climatic transect of coniferous forests in northern Europe: a synthesis.

Berg, B., Johansson, M.B., Meentemeyer, V., Dratz, W., *Scandinavian journal of forest research*, 1998, 13(4), p.402-412, 33 refs.

Plant ecology, Forest ecosystems, Climatology, Forest soils, Subarctic landscapes, Roots, Litter, Decomposition, Temperature effects, Sampling, Statistical analysis, Denmark, Sweden, Norway

### 53-3212

#### Relationships between crown condition, tree nutrition and soil properties in the coastal *Picea abies* forests (western Finland).

Merilä, P., Lindgren, M., Raitio, H., Salemaa, M., *Scandinavian journal of forest research*, 1998, 13(4), p.413-420, 46 refs.

Plant physiology, Trees (plants), Forest ecosystems, Forest canopy, Plant tissues, Degradation, Subarctic landscapes, Nutrient cycle, Forest soils, Soil chemistry, Finland

### 53-3213

#### Effects of SO<sub>2</sub> and heavy metal emissions from the Kola Peninsula, NW Russia, on soil acidity parameters in NW Russia and Finnish Lapland.

Derome, J., Lindroos, A.J., Niska, K., *Scandinavian journal of forest research*, 1998, 13(4), p.421-428, 28 refs.

Forest ecosystems, Subpolar regions, Air pollution, Aerosols, Metals, Sedimentation, Forest soils, Organic soils, Soil chemistry, Sampling, Environmental impact, Environmental tests, Russia—Kola Peninsula, Finland—Lapland

### 53-3214

#### Forest structure classes in central Finnish Lapland.

Leppäniemi, P., Hallikainen, V., Mikkola, K., Puoskari, J., Sepponen, P., *Scandinavian journal of forest research*, 1998, 13(4), p.442-450, 44 refs.

Forest ecosystems, Structural analysis, Classifications, Arctic landscapes, Altitude, Vegetation patterns, Statistical analysis, Finland—Lapland

### 53-3215

#### Structural changes in two virgin boreal forest stands in central Sweden over 72 years.

Linder, P., *Scandinavian journal of forest research*, 1998, 13(4), p.451-461, 58 refs.

Forest ecosystems, Plant ecology, Subarctic landscapes, Vegetation patterns, Biomass, Forest soils, Litter, Periodic variations, Forest fires, Environmental protection, Statistical analysis, Sweden

### 53-3216

#### Fire history recorded on pine trunks and stumps: influence of land use and fires on forest structure in North Karelia.

Lehtonen, H., *Scandinavian journal of forest research*, 1998, 13(4), p.462-468, 35 refs.

Forest ecosystems, Arctic landscapes, Vegetation patterns, Forest fires, Trees (plants), Plant tissues, Age determination, Environmental impact, Human factors, Finland—North Karelia

### 53-3217

#### Auroral activity and antarctic stratospheric ozone.

Marcucci, M.F., Orsini, S., Candidi, M., Storini, M., *Physics and chemistry of the earth C*, 1999, 24(1-3), International Symposium on Solar-Terrestrial Coupling Processes, Paros, Greece, June 23-27, 1997. Selected papers, p.141-146, 31 refs.

Geomagnetism, Electric fields, Climatology, Polar atmospheres, Ozone, Stratosphere, Solar radiation, Solar activity, Photochemical reactions, Seasonal variations, Spectroscopy, Statistical analysis, Antarctica

## 53-3218

**Annual atmospheric deposition of 16 elements in eight catchments of the central Barents region.** Chekushin, V.A., Bogatyrev, I.V., De Caritat, P., Niskavaara, H., Reimann, C., *Science of the total environment*, Sep. 18, 1998, 220(2-3), p.95-114, 24 refs.

Precipitation (meteorology), Subpolar regions, Air pollution, Aerosols, Sedimentation, Snow impurities, Meltwater, Metals, Solubility, Environmental tests, Origin, Sampling, Russia—Kola Peninsula, Finland, Norway

## 53-3219

**Ambient air levels and atmospheric long-range transport of persistent organochlorines to Signy Island, Antarctica.**

Kallenborn, R., Oehme, M., Wynn-Williams, D.D., Schlabach, M., Harris, J., *Science of the total environment*, Sep. 18, 1998, 220(2-3), p.167-180, 20 refs. Climatology, Air pollution, Hydrocarbons, Aerosols, Particles, Polar atmospheres, Atmospheric circulation, Sampling, Origin, Environmental tests, Seasonal variations, Correlation, Antarctica—Signy Island

## 53-3220

**Portable drilling rig for coring permafrosted sediments.**

Dickinson, W., Cooper, P., Webster, B., Ashby, J., *Journal of sedimentary research B*, Mar. 1999, 69(2), p.518-521, 5 refs.

Soil tests, Glacial deposits, Percussion drilling, Permafrost samplers, Core samplers, Portable equipment, Design, Performance

## 53-3221

**Energy balance of a corn residue-covered field during snowmelt.**

Sauer, T.J., Hatfield, J.L., Prueger, J.H., Logsdon, S.D., *American Water Resources Association. Journal*, Dec. 1998, 34(6), p.1401-1414, 29 refs.

Snow hydrology, Agriculture, Soil temperature, Surface temperature, Litter, Snowmelt, Snow air interface, Snow cover effect, Heat flux, Heat balance, Seasonal variations, Radiometry

## 53-3222

**Snow and ice albedo measured with two types of pyranometers.**

Henneman, H.E., Stefan, H.G., *American Water Resources Association. Journal*, Dec. 1998, 34(6), p.1487-1494, 14 refs.

Climatology, Radiation balance, Albedo, Solar radiation, Snow optics, Ice optics, Sensors, Photometers, Specifications, Performance, Accuracy

## 53-3223

**Airfield construction team 1984—Casey '84.**

Australian National Antarctic Research Expedition, [Kingston, Tasmania], [1984], n.p. Stations, Site surveys, Aircraft landing areas, Ice runways, Snow (construction material), Snow compaction, Trafficability, Antarctica—Casey Station

## 53-3224

**Annual report—Fiscal Year 1982.**

U.S. National Aeronautics and Space Administration. Goddard Space Flight Center. Goddard Laboratory for Atmospheric Sciences. Oceans and Ice Branch, Greenbelt, MD, [1983], 73p., Refs. passim. Organizations, Research projects, Oceanographic surveys, Ice surveys, Glacier surveys, Air ice water interaction

## 53-3225

**Construction activities in permafrost. [Anläggningsverksamhet vid permafrost]**

Knutsson, S., *Högskolan i Luleå. Teknisk rapport (Luleå University. Technical report)*, Mar. 1985, No.1985:31 T, 22p., In Swedish. 8 refs.

Permafrost beneath roads, Permafrost beneath structures, Permafrost control, Permafrost preservation, Frost protection, Soil stabilization

## 53-3226

**Heaving and settling as a result of freezing along land reclamation heat collector pipes. [Hävning och sättning till följd av frysnings invid markförälgda kollektorslangar]**

Knutsson, S., *Högskolan i Luleå. Teknisk rapport (Luleå University. Technical report)*, [1983], No.1983:62 T, 11p., In Swedish. 8 refs.

Soil freezing, Frost heave, Frozen ground settling, Heat pumps, Heat pipes, Frost protection, Land reclamation, Soil stabilization

## 53-3227

**Field study of the properties of an axially extensible plastic drain pipe in frost heaving soil. [Fältstudie av en axiellt töjbar plastbrunnens egenskaper i tjällyftande jord]**

Knutsson, S., Vikström, L., *Högskolan i Luleå. Teknisk rapport (Luleå University. Technical report)*, Dec. 1982, No.1983:17 T, 51p., In Swedish with English summary. 9 refs.

Soil freezing, Frost heave, Frost action, Drains, Pipes (tubes), Drainage, Frost resistance, Frost protection, Road maintenance

## 53-3228

**Effect of cyclic freezing on the consistency limits of clay. [Inverkan av cyklisk frysnings på lerors konsistensgränser]**

Knutsson, S., *Högskolan i Luleå. Forskningsrapport (Luleå University. Research report)*, [1984], TULEA 1984:04, 8p., In Swedish. 5 refs.

Clay soils, Soil freezing, Soil structure, Frost action, Frost resistance, Frozen ground strength

## 53-3229

**Field study of storm drains and manholes with protective covers. [Fältstudie av rännstensbrunnar och nedstigningsbrunnar försedda med fogskydd]**

Knutsson, S., *Högskolan i Luleå. Forskningsrapport (Luleå University. Research report)*, Mar. 1982, TULEA 1982:14, 112p. + appends., In Swedish. 14 refs.

Soil freezing, Frost action, Drains, Drainage, Water intakes, Covering, Frost protection

## 53-3230

**Some regularities in thermokarst development.**

Jahn, A., *Université de Liège. Congrès et colloques*, 1972, Vol.67, Symposium International de Géomorphologie, Liège, Belgium, 1972, p.167-176, 19 refs. For another paper from the same symposium see 39-884.

Permafrost hydrology, Permafrost heat balance, Ground thawing, Thermokarst development, Thermokarst lakes

## 53-3231

**High intensity radiated field external environments for civil aircraft operating in the United States of America.**

Heather, F.W., *U.S. Naval Air Warfare Center Aircraft Division, Patuxent River, MD. Technical memorandum*, Dec. 1998, NAWCADPAX-98-156-TM, 129p., ADA-359 456, 12 refs. Also published as U.S. Federal Aviation Administration, Office of Aviation Research. Washington, D.C., Report, DOT/FAA/AR-98/69.

Aircraft, Airplanes, Helicopters, Radio waves, Electric fields, Radiation measurement, Route surveys, Safety, United States

## 53-3232

**Mid-Pleistocene cosmogenic minimum-age limits for pre-Wisconsinan glacial surfaces in southwestern Minnesota and southern Baffin Island: a multiple nuclide approach.**

Bierman, P.R., Marsella, K.A., Patterson, C., Davis, P.T., Caffee, M., *Geomorphology*, Feb. 1999, 27(1-2), p.25-39, 31 refs.

Pleistocene, Geomorphology, Glacial geology, Bedrock, Weathering, Striations, Glacial erosion, Gamma irradiation, Isotope analysis, Radioactive age determination, Statistical analysis, Canada—Northwest Territories—Baffin Island, United States—Minnesota

## 53-3233

**Use of cosmogenic <sup>35</sup>S for comparing ages of water from three alpine-subalpine basins in the Colorado Front Range.**

Sueker, J.K., Turk, J.T., Michel, R.L., *Geomorphology*, Feb. 1999, 27(1-2), p.61-74, 34 refs.

Watersheds, Water storage, Snow hydrology, Snowmelt, Runoff, Alpine landscapes, Subsurface drainage, Hydrography, Radioactive age determination, Gamma irradiation, Isotope analysis, Topographic effects, Seasonal variations, United States—Colorado—Front Range

## 53-3234

**Determining the times and distances of particle transit in a mountain stream using fallout radionuclides.**

Bonniwell, E.C., Matisoff, G., Whiting, P.J., *Geomorphology*, Feb. 1999, 27(1-2), p.75-92, 21 refs.

Watersheds, Geomorphology, Water erosion, Sediment transport, Soil profiles, Snow hydrology, Snowmelt, Runoff, Hydrography, Suspended sediments, Fallout, Radioactive isotopes, Isotope analysis, United States—Idaho—Gold Fork River

## 53-3235

**Long-term rates of denudation in the Dry Valleys, Transantarctic Mountains, southern Victoria Land, Antarctica based on in-situ-produced cosmogenic <sup>21</sup>Ne.**

Summerfield, M.A., et al, *Geomorphology*, Feb. 1999, 27(1-2), p.113-129, 52 refs.

Pleistocene, Paleoclimatology, Geomorphology, Glacier oscillation, Landscape development, Bedrock, Erosion, Gamma irradiation, Isotope analysis, Theories, Antarctica—Transantarctic Mountains

## 53-3236

**Estimates of the rate of regolith production using <sup>10</sup>Be and <sup>26</sup>Al from an alpine hillslope.**

Small, E.E., Anderson, R.S., Hancock, G.S., *Geomorphology*, Feb. 1999, 27(1-2), p.131-150, 33 refs.

Geomorphology, Geologic processes, Alpine landscapes, Bedrock, Regolith, Erosion, Slope processes, Mass balance, Gamma irradiation, Mathematical models, Sampling, United States—Wyoming—Wind River Range

## 53-3237

**Non-analogous tree flora in the Scandes Mountains, Sweden, during the early Holocene—macrofossil evidence of rapid geographic spread and response to palaeoclimate.**

Kullman, L., *Boreas*, Sep. 1998, 27(3), p.153-161, Refs. p.159-161.

Paleoecology, Paleoclimatology, Subpolar regions, Biogeography, Vegetation patterns, Quaternary deposits, Fossils, Palynology, Stratigraphy, Radioactive age determination, Sweden—Scandes Mountains

## 53-3238

**Deglaciation chronology and marine environments in southwestern Sweden.**

Wastegård, S., *Boreas*, Sep. 1998, 27(3), p.178-194, Refs. p.192-194.

Pleistocene, Paleoclimatology, Paleoecology, Glacial geology, Lacustrine deposits, Subpolar regions, Shoreline modification, Glacier oscillation, Ice edge, Geochronology, Radioactive age determination, Stratigraphy, Drill core analysis, Sweden

## 53-3239

**Little goes a long way: discovery of a new mid-Holocene tephra in Sweden.**

Boyle, J., *Boreas*, Sep. 1998, 27(3), p.195-199, 31 refs.

Quaternary deposits, Volcanic ash, Aerosols, Geochronology, Radioactive age determination, Subarctic landscapes, Geochemistry, Drill core analysis, Stratigraphy, Sweden

53-3240

Early Weichselian dust storm layer at Achenheim in Alsace, France.

Rousseau, D.D., Kukla, G., Zöller, L., Hradilova, J., *Boreas*, Sep. 1998, 27(3), p.200-207, 47 refs.

Pleistocene, Paleoclimatology, Climatic changes, Quaternary deposits, Soil formation, Landscape development, Loess, Storms, Stratigraphy, Remanent magnetism, Correlation, France—Alsace

53-3241

Reconstruction of Holocene climatic changes from peat bogs in north-west Scotland.

Anderson, D.E., *Boreas*, Sep. 1998, 27(3), p.208-224, Refs. p.222-224.

Paleoclimatology, Climatic changes, Paleocology, Palynology, Quaternary deposits, Peat, Stratigraphy, Radioactive age determination, Drill core analysis, Humidity, Swamps, United Kingdom—Scotland

53-3242

"Pre-Younger Dryas resurgence of the southwestern margin of the Cordilleran ice sheet, British Columbia, Canada": comments and reply.

Easterbrook, D.J., et al, *Boreas*, Sep. 1998, 27(3), p.225-230, 22 refs. For pertinent paper see 52-3385.

Pleistocene, Ice sheets, Glacial geology, Glacial deposits, Glacier oscillation, Geochronology, Accuracy, Ice age theory, Canada—British Columbia

53-3243

Tracking polar stratospheric cloud development with POAM II and a microphysical model.

Steele, H.M., Drdla, K., Turco, R.P., Lumpe, J.D., Bevilacqua, R.M., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.287-290, 24 refs.

Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Attenuation, Particle size distribution, Aerosols, Heterogeneous nucleation, Ice formation, Sampling, Models, Antarctica

53-3244

Intercomparison of ATMOS, SAGE II, and ER-2 observations in arctic vortex and extra-vortex air masses during spring 1993.

Michelsen, H.A., et al, *Geophysical research letters*, Feb. 1, 1999, 26(3), p.291-294, 20 refs.

Climatology, Polar atmospheres, Air masses, Chemical composition, Aerosols, Turbulent diffusion, Spectroscopy, Sampling, Photochemical reactions, Correlation

53-3245

CF<sub>4</sub> and the age of mesospheric and polar vortex air.

Harnisch, J., Borchers, R., Fabian, P., Maiss, M., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.295-298, 26 refs.

Climatology, Air pollution, Aerosols, Gases, Turbulent diffusion, Atmospheric boundary layer, Polar atmospheres, Sampling, Age determination

53-3246

TDLAS trace gas measurements within mountain waves over northern Scandinavia during the POLSTAR campaign in early 1997.

Schilling, T., Lübken, F.J., Wienhold, F.G., Hoor, P., Fischer, H., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.303-306, 6 refs.

Climatology, Polar atmospheres, Atmospheric composition, Gravity waves, Wind direction, Mountains, Topographic effects, Gases, Aerial surveys, Spectroscopy, Sweden

53-3247

Correction to "Ozone loss rates in the arctic stratosphere in the winter 1991/92: model calculations compared with Match results".

Becker, G., Müller, R., McKenna, D.S., Rex, M., Carslaw, K.S., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.327, 1 ref. For pertinent paper see 53-1712.

Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Ozone, Degradation, Models

53-3248

Eurasian snow cover variability and northern hemisphere climate predictability.

Cohen, J., Entekhabi, D., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.345-348, 20 refs.

Climatology, Precipitation (meteorology), Snow cover distribution, Atmospheric boundary layer, Atmospheric circulation, Snow air interface, Snow cover effect, Wind direction, Seasonal variations, Correlation

53-3249

Study of the energy balance climate model with CO<sub>2</sub>-dependent outgoing radiation: Implication for the glaciation during the Cenozoic.

Ikeda, T., Tajika, E., *Geophysical research letters*, Feb. 1, 1999, 26(3), p.349-352, 20 refs.

Pleistocene, Paleoclimatology, Climatic changes, Glaciation, Glacier oscillation, Greenhouse effect, Carbon dioxide, Radiation balance, Heat transfer, Thermal diffusion, Mathematical models

53-3250

Difference between sorted circle and polygon morphology and their distribution in two alpine areas, northern Sweden.

Kling, J., *Zeitschrift für Geomorphologie*, Dec. 1998, 42(4), p.439-452, With German and French summaries. 29 refs.

Geomorphology, Alpine landscapes, Geophysical surveys, Geocryology, Solifluction, Polygonal topography, Patterned ground, Sorting, Distribution, Statistical analysis, Sweden

53-3251

Active vegetation-banked terraces on Macquarie Island.

Selkirk, J.M., *Zeitschrift für Geomorphologie*, Dec. 1998, 42(4), p.483-496, With German and French summaries. 34 refs.

Geomorphology, Geocryology, Periglacial processes, Subarctic landscapes, Patterned ground, Gravel, Sorting, Terraces, Vegetation factors, Macquarie Island

53-3252

Large volume silicic volcanism along the proto-Pacific margin in Gondwana: lithological and stratigraphical investigations from the Antarctic Peninsula.

Riley, T.R., Leat, P.T., *Geological magazine*, Jan. 1999, 136(1), p.1-16, Refs. p.13-16.

Tectonics, Subpolar regions, Geologic processes, Earth crust, Volcanoes, Magma, Lithology, Stratigraphy, Geochronology, Antarctica—Antarctic Peninsula

53-3253

Widespread bacterial populations at glacier beds and their relationship to rock weathering and carbon cycling.

Sharp, M., Parkes, J., Cragg, B., Fairchild, I.J., Lamb, H., Tranter, M., *Geology*, Feb. 1999, 27(2), p.107-110, 30 refs.

Glacial hydrology, Glacier beds, Weathering, Ice solid interface, Microbiology, Bacteria, Biomass, Carbon dioxide, Protons, Geochemical cycles, Sampling, Switzerland—Haut Glacier d'Arolla

53-3254

Radiocarbon constraints on ice sheet advance and retreat in the Weddell Sea, Antarctica.

Anderson, J.B., Andrews, J.T., *Geology*, Feb. 1999, 27(2), p.179-182, 32 refs.

Glacial geology, Ice sheets, Glacier oscillation, Ice shelves, Quaternary deposits, Marine deposits, Ice rafting, Lithology, Radioactive age determination, Drill core analysis, Geochronology, Antarctica—Weddell Sea

53-3255

Definition of Antarctic Oscillation Index.

Gong, D.Y., Wang, S.W., *Geophysical research letters*, Feb. 15, 1999, 26(4), p.459-462, 23 refs.

Climatology, Polar atmospheres, Atmospheric circulation, Atmospheric pressure, Oscillations, Indexes (ratios), Statistical analysis, Standards, Antarctica

53-3256

Two-year (1996/1997) ozone DIAL measurement over Dumont d'Urville (Antarctica).

Santacesaria, V., Stefanutti, L., Morandi, M., Guzzi, D., MacKenzie, A.R., *Geophysical research letters*, Feb. 15, 1999, 26(4), p.463-466, 13 refs.

Climatology, Polar atmospheres, Cloud physics, Polar stratospheric clouds, Ozone, Subsidence, Turbulent diffusion, Degradation, Seasonal variations, Sampling, Antarctica—Dumont d'Urville Station

53-3257

Decadal-scale variability in long-range atmospheric transport to the Summit of the Greenland ice sheet.

Kahl, J.D.W., Galbraith, J.A., Martinez, D.A., *Geophysical research letters*, Feb. 15, 1999, 26(4), p.481-484, 18 refs.

Paleoclimatology, Climatic changes, Ice sheets, Ice cores, Sedimentation, Chemical composition, Atmospheric circulation, Seasonal variations, Origin, Sampling, Greenland—Summit

53-3258

Geomagnetic excursions recorded in Chinese loess in the last 70,000 years.

Zhu, R.X., Pan, Y.X., Liu, Q.S., *Geophysical research letters*, Feb. 15, 1999, 26(4), p.505-508, 21 refs.

Pleistocene, Geomagnetism, Oscillations, Loess, Rock magnetism, Remanent magnetism, Sedimentation, Stratigraphy, China—Loess Plateau

53-3259

Lipids and trophic interactions of ice fauna and pelagic zooplankton in the marginal ice zone of the Barents Sea.

Scott, C.L., Falk-Petersen, S., Sargent, J.R., Hop, H., Lønne, O.J., Poltermann, M., *Polar biology*, Feb. 1999, 21(2), p.65-70, 38 refs.

Marine biology, Sea ice, Ice edge, Ecosystems, Plankton, Nutrient cycle, Sampling, Chemical analysis, Barents Sea

53-3260

Sub-ice fauna of the Laptev Sea and the adjacent Arctic Ocean in summer 1995.

Werner, I., Martinez Arbizu, P., *Polar biology*, Feb. 1999, 21(2), p.71-79, 62 refs.

Marine biology, Ecosystems, Plankton, Biomass, Classifications, Ice water interface, Subglacial observations, Hydrography, Arctic Ocean, Russia—Laptev Sea

53-3261

New records of Acari from the sub-antarctic Prince Edwards Islands.

Marshall, D.J., et al, *Polar biology*, Feb. 1999, 21(2), p.84-89, 39 refs.

Biogeography, Ecosystems, Biomass, Ecology, Littoral zone, Subpolar regions, Classifications, Distribution, Sampling, Prince Edward Islands, Marion Island

53-3262

*Penicillium* species from terrestrial habitats in the Windmill Islands, East Antarctica, including a new species, *Penicillium antarcticum*.

McRae, C.F., Hocking, A.D., Seppelt, R.D., *Polar biology*, Feb. 1999, 21(2), p.97-111, 37 refs.

Soil microbiology, Bacteria, Subpolar regions, Ecology, Biomass, Ecosystems, Distribution, Classifications, Antarctica—Windmill Islands

53-3263

Feeding dynamics and respiration of the bottom-dwelling caridean shrimp *Nauticaris marionis* Bate, 1888 (Crustacea: Decapoda) in the vicinity of Marion Island (southern ocean).

Pakhomov, E.A., Froneman, P.W., Kuun, P.J., Balarin, M., *Polar biology*, Feb. 1999, 21(2), p.112-121, 41 refs.

Marine biology, Subpolar regions, Biomass, Ecology, Nutrient cycle, Ocean bottom, Sampling, Marion Island

53-3264

**Annual report 1987.**

National Snow and Ice Data Center. World Data Center-A for Glaciology, Boulder, University of Colorado, 1987, 27p., Refs. passim.  
Snow surveys, Ice surveys, Glacier surveys, Organizations, Research projects, Data processing, Cost analysis

53-3265

**1990 Military Mountaineering Conference.**

Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, Var. p., For selected papers see 53-3266 through 53-3271. Military operation, Cold weather operation, Cold weather survival, Cold exposure, Physiological effects, Health, Safety

53-3266

**Individual cold weather operations and medicine.**

Hamlet, M., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/4-5/13. Cold exposure, Frostbite, Physiological effects, Health, Safety, Cold weather survival

53-3267

**Mountain weather forecasting.**

Ferguson, S.A., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/17-5/24. Thunderstorms, Snowstorms, Fronts (meteorology), Wind (meteorology), Precipitation (meteorology), Air temperature, Frost forecasting, Weather forecasting

53-3268

**U.S. Army snow and avalanche training, past and present.**

Montagne, J., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/26-5/36, 17 refs. Snow cover stability, Avalanche forecasting, Military operation, Education, Safety, Cold weather operation, Cold weather survival

53-3269

**Stresses of high mountains.**

Houston, C.S., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/37-5/40. Cold exposure, Frostbite, Physiological effects, Health, Safety, Cold weather survival

53-3270

**Small unit tactics in Norway during WW II.**

Colby, W.E., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/55-5/65. Military operation, History, Cold weather operation, Cold weather survival, Norway

53-3271

**Austrian mountain school.**

Lasser, M., Military Mountaineering Conference, Jericho, VT, Apr. 17-19, 1990, Jericho, Vermont Army National Guard (ARNG) Mountain Warfare School, 1990, p.5/66-5/70. Military operation, Education, Cold weather operation, Cold weather survival, Austria

53-3272

**Sediment fluxes along the northeastern European margin: inferring hydrological changes between 20 and 8 kyr.**

Abrantes, F., et al, *Marine geology*, Nov. 1998, 152(1-3), p.7-23, Refs. p.21-23. Marine geology, Ocean currents, Paleoclimatology, Surface temperature, Paleogeology, Icebergs, Ice rafting, Sediment transport, Drill core analysis, Radioactive age determination, Hydrography, Norwegian Sea, Atlantic Ocean

53-3273

**Mid-depth oxygen drawdown during Heinrich events: evidence from benthic foraminiferal community structure, trace-fossil tiering, and benthic  $\delta^{13}\text{C}$  at the Portuguese margin.**

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53-3274

**Norwegian Sea overflow variability and NE Atlantic surface hydrography during the past 150,000 years.**

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53-3275

**Quaternary sedimentation and Norwegian Sea overflow pathways around Bill Bailey Bank, northeastern Atlantic.**

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53-3276

**Neogene seismic facies and deep-water gateways in the Faeroe Bank area, NE Atlantic.**

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53-3277

**Seismic stratigraphy and sedimentary processes at the Norwegian Sea margin northeast of the Faeroe Islands.**

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53-3278

**Sediments and sedimentation at the NE Faeroe continental margin; contourites and large-scale sliding.**

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53-3279

**Rapid changes in the oceanic fronts in the Norwegian Sea during the last deglaciation: Implications for the Younger Dryas cooling event.**

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53-3280

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Pleistocene, Marine geology, Glacier oscillation, Icebergs, Subpolar regions, Ocean currents, Bottom sediment, Glacial deposits, Sedimentation, Drill core analysis, Lithology, Geochronology, North Sea

53-3281

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Pleistocene, Glacial geology, Marine geology, Subpolar regions, Ice shelves, Glacier flow, Marine deposits, Glacial deposits, Sediment transport, Stratigraphy, Lithology, Drill core analysis, Remanent magnetism, North Sea

53-3282

**Investigation of pole-to-pole performances of spaceborne atmospheric chemistry sensors with the NDSC.**

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Climatology, Climatic changes, Global change, Atmospheric composition, Stratosphere, Ozone, Chemical composition, Polar atmospheres, Remote sensing, Spacecraft, Sensors, Classifications, Sensor mapping, Performance

53-3283

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Climatology, Polar atmospheres, Stratosphere, Atmospheric composition, Aerosols, Photochemical reactions, Particle size distribution, Aerial surveys, Radiance, Attenuation, Profiles, Polarization (waves), Radiometry

53-3284

**Identification of source nature and seasonal variations of arctic aerosol by positive matrix factorization.**

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Climatology, Polar atmospheres, Atmospheric composition, Aerosols, Chemical analysis, Classifications, Photochemical reactions, Ion density (concentration), Origin, Sampling, Statistical analysis, Canada—Northwest Territories—Alert

53-3285

**Tropospheric gases and aerosols in northeast Greenland.**

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Climatology, Polar atmospheres, Air pollution, Atmospheric composition, Atmospheric circulation, Aerosols, Gases, Seasonal variations, Origin, Sampling, Models, Environmental tests, Greenland

53-3286

**Aquatic sources and sinks of CO<sub>2</sub> and CH<sub>4</sub> in the polar regions.**

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Climatology, Oceanographic surveys, Marine atmospheres, Polar atmospheres, Surface waters, Atmospheric composition, Aerosols, Natural gas, Carbon dioxide, Saturation, Vapor transfer, Hydrography, Arctic Ocean, Russia—Siberia

53-3287

**U-Pb geochronology of Riphean sandstone and gabbro from southeast Siberia and its bearing on the Laurentia-Siberia connection.**

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Pleistocene, Tectonics, Subpolar regions, Geochronology, Lithology, Magma, Stratigraphy, Isotope analysis, Radioactive age determination, Origin, Continental drift, Models, Russia—Siberia

53-3288

**Fission-track evidence for apparent out-of-sequence Cenozoic deformation along the Philip Smith Mountain front, northeastern Brooks Range, Alaska.**

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Pleistocene, Earth crust, Subpolar regions, Tectonics, Lithology, Stratigraphy, Deformation, Geochronology, Radioactive age determination, Sampling, Statistical analysis, United States—Alaska—Brooks Range

53-3289

**Seasonal variations of heavy metals in the 1960s alpine ice: sources versus meteorological factors.**

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Environmental tests, Air pollution, Meteorological factors, Aerosols, Alpine landscapes, Glacier ice, Ice cores, Metals, Sampling, Origin, Ice dating, Seasonal variations, France—Mont Blanc

53-3290

**Magnetic anisotropy and environmental changes in two sedimentary cores from the Norwegian Sea and the North Atlantic.**

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Pleistocene, Paleoclimatology, Climatic changes, Oceanographic surveys, Subpolar regions, Bottom sediment, Sedimentation, Drill core analysis, Grain size, Remanent magnetism, Anisotropy, Norwegian Sea, Atlantic Ocean

53-3291

**Problems with using radiocarbon to infer ocean ventilation rates for past and present climates.**

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Paleoclimatology, Sea water, Radioactive age determination, Ocean currents, Ventilation, Marine deposits, Carbon isotopes, Air water interactions, Ice age theory, Ice cover effect, Models, Antarctica—Weddell Sea, Bering Strait

53-3292

**Mantle flow, melting, and dehydration of the Iceland mantle plume.**

Ito, G., Shen, Y., Hirth, G., Wolfe, C.J., *Earth and planetary science letters*, Jan. 15, 1999, 165(1), p.81-96, 50 refs.

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53-3293

**High-resolution chronostratigraphy from down-hole susceptibility logging tuned by palaeoclimatic orbital frequencies.**

Barthès, V., Pozzi, J.P., Vibert-Charbonnel, P., Thibaut, J., Mélières, M.A., *Earth and planetary science letters*, Jan. 15, 1999, 165(1), p.97-116, 43 refs.

Pleistocene, Paleoclimatology, Climatic changes, Insolation, Marine deposits, Stratigraphy, Boreholes, Remanent magnetism, Oxygen isotopes, Spectra, Correlation, Geochronology, North Sea

53-3294

**Torfajökull: a radiogenic end-member of the Iceland Pb-isotopic array.**

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Pleistocene, Lithology, Subpolar regions, Earth crust, Geologic structures, Geologic processes, Volcanoes, Magma, Radioactive isotopes, Isotope analysis, Statistical analysis, Iceland—Torfajökull

53-3295

**Stalagmite luminescence and peat humification records of palaeomicroclimate for the last 2500 years.**

Baker, A., et al., *Earth and planetary science letters*, Jan. 15, 1999, 165(1), p.157-162, 25 refs.

Paleoclimatology, Climatic changes, Swamps, Peat, Organic soils, Moisture transfer, Soil formation, Oscillations, Luminescence, Spectroscopy, United Kingdom—Scotland

53-3296

**Distribution of Late Valday mammals and plants on the northern Russian plain.**

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Pleistocene, Paleoclimatology, Global change, Paleogeology, Palynology, Subarctic landscapes, Plains, Tundra vegetation, Forest ecosystems, Vegetation patterns, Distribution, Russia

53-3297

**Small cryogenic erosional relief forms in the steppes of Transbaykalia.**

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Geocryology, Permafrost hydrology, Gullies, Steppes, Geomorphology, Cryogenic soils, Soil erosion, Surface drainage, Frost action, Naleds, Climatic factors, Seasonal variations, Russia—Siberia

53-3298

**Lakes of the Novaya Zemlya archipelago.**

Vekhov, N.V., *Polar geography*, July-Sep. 1998, 22(3), p.181-191, Translated from *Geografiya i prirodnye resursy*, 6 refs.

Lakes, Surveys, Tundra terrain, Arctic landscapes, Distribution, Geography, Classifications, Environmental protection, Russia—Novaya Zemlya

53-3299

**Monitoring ground-temperature conditions in central Sakha.**

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Climatology, Global warming, Permafrost surveys, Permafrost transformation, Frozen ground temperature, Air temperature, Temperature measurement, Seasonal freeze thaw, Classifications, Seasonal variations, Correlation, Russia—Yakutsk

53-3300

**Vertical vegetation zonation in the mountains of northeast Siberia.**

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Plant ecology, Arctic landscapes, Mountains, Tundra terrain, Tundra vegetation, Vegetation patterns, Classifications, Altitude, Microclimatology, Russia—Siberia

53-3301

**Water-heat budget and ecological structure of icing landscape complexes.**

Alekseev, V.R., *Polar geography*, July-Sep. 1998, 22(3), p.211-221, Translated from *Geografiya i prirodnye resursy*, 12 refs.

Geocryology, Naleds, Icing, Periglacial processes, Ecosystems, Landscape development, Landscape types, Classifications, Analysis (mathematics)

53-3302

**Moisture conditions in xeric plant associations along the Upper Kolyma.**

Prokopets, M.E., Alfimov, A.V., *Polar geography*, July-Sep. 1998, 22(3), p.222-230, Translated from *Geografiya i prirodnye resursy*, 18 refs.

Plant ecology, Ecosystems, Arctic landscapes, Deserts, Tundra vegetation, Vegetation patterns, Plant physiology, Evaporation, Moisture transfer, Wind factors, Turbulent diffusion, Microclimatology, Russia—Kolyma River

53-3303

**Glaciations in European highlands.**

[Vergletscherungen in europäischen Mittelgebirgen]

Kostrzewski, A., ed, Hagedorn, H., ed, *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, 95p., In German or English. Refs. passim. For selected papers see 53-3304 through 53-3309.

Alpine glaciation, Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Moraines, Geomorphology, Geochronology, Paleoclimatology

53-3304

**Glaciation of the Riesengebirge (Giant Mountains in English, Karkonosze in Polish). [Die Vergletscherung des Riesengebirges]**

Chmal, H., Traczyk, A., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kostrzewski and H. Hagedorn, p.11-17, In German. 21 refs.

Alpine glaciation, Glacial geology, Glacial deposits, Moraines, Rock glaciers, Geological surveys, Stratigraphy, Geochronology, Paleoclimatology, Poland

53-3305

**Problems of glaciation of the High Tatra Mountains—Joseph Partsch synthesis in the light of current knowledge.**

Kotarba, A., Baumgart-Kotarba, M., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kostrzewski and H. Hagedorn, p.19-31, 17 refs.

Alpine glaciation, Glacial geology, Glacial erosion, Glacial deposits, Moraines, Lacustrine deposits, Forest lines, Snow line, Geochronology, Paleoclimatology, Poland—Tatra Mountains

53-3306

**Role of "reglacial" relief in the development of mountain glaciation in the Sudetes, with the special reference to the Karkonosze Mountains.**

Migoń, P., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kostrzewski and H. Hagedorn, p.33-44, 25 refs.

Alpine glaciation, Geological surveys, Glacial geology, Glacial erosion, Nivation, Topographic effects, Tectonics, Geomorphology, Geochronology, Poland

53-3307

**Glacial landforms in the area of Kleiner Arbersee (Bavarian Forest, Germany). [Der glaziale Formenschatz im Gebiet um den Kleinen Arbersee (Bayerischer Wald, Deutschland)]**

Bucher, M., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kostrzewski and H. Hagedorn, p.45-58, In German with English summary. 15 refs.

Alpine glaciation, Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Moraines, Glacial lakes, Nivation, Snow line, Geomorphology, Germany



- 53-3308**  
Pleistocene glaciation in the east of the Russian Plain: Ural or Scandinavian glacier? [Die pleistozäne Vergletscherung im Osten der Russischen Ebene: Zentrum im Ural oder Skandinavien?] Dedkov, A.P., Butakov, G.P., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kozrzewski and H. Hagedorn, p.59-67, In German with English summary. 11 refs.  
Glaciation, Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Glacial till, Moraines, Pleistocene, Soil dating, Geochronology, Paleoclimatology, Russia
- 53-3309**  
Lateral moraines—morphology, genesis, and relation to glacier fluctuations (examples from the eastern Alps and western and central Norway). [Lateralmoränen—Morphologie, Genese und Beziehung zu Gletscherstandsschwankungen (Beispiele aus Ostalpen und West-/Zentralnorwegen)] Winkler, S., Hagedorn, H., *Zeitschrift für Geomorphologie. Supplementband*, 1999, Vol.113, Vergletscherungen in europäischen Mittelgebirgen (Glaciations in European highlands). Edited by A. Kozrzewski and H. Hagedorn, p.69-84, In German with English summary. 24 refs.  
Alpine glaciation, Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Glacial till, Moraines, Glacier oscillation, Geomorphology, Geochronology, Paleoclimatology, Alps, Norway
- 53-3310**  
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Cloud physics, Cloud droplets, Aerosols, Condensation nuclei, Supersaturation, Nucleus counters, Meteorological instruments, Mathematical models
- 53-3311**  
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Atmospheric composition, Aerosols, Dust, Air pollution, Snow air interface, Scavenging, Snow composition, Snow impurities, Snow samplers, Glacial meteorology, Ice composition, China—Tian Shan
- 53-3312**  
Correlations of stratospheric abundances of  $\text{NO}_y$ ,  $\text{O}_3$ ,  $\text{N}_2\text{O}$ , and  $\text{CH}_4$ , derived from ATMOS measurements. Michelsen, H.A., Manney, G.L., Gunson, M.R., Zander, R., *Journal of geophysical research*, Nov. 20, 1998, 103(D21), p.28,347-28,359, 78 refs.  
Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Air masses, Ozone, Statistical analysis
- 53-3313**  
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Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Aerosols, Ozone, Photochemical reactions
- 53-3314**  
Two-dimensional model with input parameters from a general circulation model: ozone sensitivity to different formulations for the longitudinal temperature variation. Smyshliaev, S.P., Dvortsov, V.L., Geller, M.A., Yudin, V.A., *Journal of geophysical research*, Nov. 20, 1998, 103(D21), p.28,373-28,387, 59 refs.  
Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Ozone, Polar stratospheric clouds, Computerized simulation
- 53-3315**  
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Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Ozone, Polar stratospheric clouds, Computerized simulation
- 53-3316**  
Composition-dependent freezing nucleation rates for  $\text{HNO}_3/\text{H}_2\text{O}$  aerosols resembling gravity-wave-perturbed stratospheric particles. Prenni, A.J., Onasch, T.B., Tisdale, R.T., Siefert, R.L., Tolbert, M.A., *Journal of geophysical research*, Nov. 20, 1998, 103(D21), p.28,439-28,450, 37 refs.  
Atmospheric composition, Aerosols, Polar stratospheric clouds, Cloud physics, Freezing nuclei, Ice nuclei, Nucleation rate
- 53-3317**  
[Proceedings]. National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, Watanabe, O., ed, *Polar meteorology and glaciology*, Nov. 1998, No.12, 177p., Refs. passim. For individual papers see 53-3318 through 53-3322.  
Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Air ice water interaction, Sea ice distribution, Ice conditions
- 53-3318**  
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Snow cover structure, Snow stratigraphy, Snow composition, Snow impurities, Dust, Carbon black, Snow air interface, Snow heat flux, Snow optics, Albedo, United States—Alaska—Barrow
- 53-3319**  
Observations of liquid water, water vapor, and downward flux of infrared radiation in the arctic region with a microwave radiometer and a pyrgeometer. Ishida, M., et al, *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.10-18, 8 refs.  
Polar atmospheres, Atmospheric composition, Cloud cover, Cloud physics, Unfrozen water content, Water vapor, Humidity, Air temperature, Radiation balance, Infrared radiation, Radiation measuring instruments, Radiometry, Canada—Northwest Territories—Inuvik, Sweden
- 53-3320**  
On the stratospheric ozone loss over Eureka Station in the Canadian Arctic. Hirota, M., et al, *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.19-28, 10 refs.  
Polar atmospheres, Atmospheric composition, Air temperature, Polar stratospheric clouds, Ozone, Canada—Northwest Territories—Eureka
- 53-3321**  
Lidar observation above Svalbard, Norway in the winter of 1996/97—characteristics of backscattering ratio and depolarization ratio of PSC particles. Shirasaki, K., et al, *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.29-39, 15 refs.  
Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ozone, Lidar, Backscattering, Norway—Spitsbergen
- 53-3322**  
Size distribution of aerosols at Barrow in Alaska—a case study in spring. Zaizen, Y., et al, *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.40-48, 12 refs.  
Polar atmospheres, Atmospheric composition, Air pollution, Haze, Aerosols, Condensation nuclei, Particle size distribution, United States—Alaska—Barrow
- 53-3323**  
Ionic constituents in aerosol particles at Syowa Station, East Antarctica, during 1996. Osada, K., Hayashi, M., Ui, H., Iwasaka, Y., *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.49-57, 27 refs.  
Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Aerosols, Particle size distribution, Ion density (concentration), Antarctica—Showa Station
- 53-3324**  
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Marine atmospheres, Atmospheric circulation, Ocean currents, Surface temperature, Air ice water interaction, Sea ice distribution, Ice edge, Drift, Ice cover effect, Statistical analysis
- 53-3325**  
Preliminary study on decadal oscillation and its oscillation source in the sea-ice-air system in the Northern Hemisphere. Gao, D.Y., Wu, B.Y., *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.68-78, 15 refs.  
Sea ice distribution, Ice conditions, Ice cover effect, Air ice water interaction, Ocean currents, Marine atmospheres, Atmospheric circulation, Statistical analysis, Barents Sea, Russia—Kara Sea
- 53-3326**  
Role of floe size in ice dynamics. Ito, H., *Polar meteorology and glaciology*, Nov. 1998, No.12, National Institute of Polar Research (NIPR) Symposium on Polar Meteorology and Glaciology, 20th, Tokyo, Nov. 26-27, 1997, p.79-85.  
Sea ice distribution, Ice conditions, Ice floes, Ice water interface, Drift, Ice friction, Ice pressure, Ice cover strength, Ice deformation, Ice growth, Ice models
- 53-3327**  
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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radiometry, Spaceborne photography, Russia—Sakhalin Island, Okhotsk Sea, Antarctica—Molodezhnaya Station

53-3328

Cloud extraction from polar satellite data using modified Mahalanobis classifier.  
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Cloud cover, Terrain identification, Albedo, Radiometry, Spaceborne photography, Image processing, Antarctica—Showa Station

53-3329

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Climatology, Cloud physics, Optical properties, Ice crystal optics, Infrared radiation, Scattering, Analysis (mathematics), Transmissivity

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**Remote sensing of oil spills on frozen ground.**

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Soil pollution, Oil spills, Detection, Subpolar regions, Ecosystems, Frozen ground, Remote sensing, Synthetic aperture radar, Geophysical surveys, Spaceborne photography, Forecasting

## 53-3359

**Influence of soil microstructure on hydraulic properties of hydrocarbon-contaminated freezing ground.**

White, T.L., Williams, P.J., *Polar record*, Jan. 1999, 35(192), Conference on Contaminants in Freezing Ground, Cambridge, UK, July 13-15, 1997. Selected papers, p.25-32, 18 refs.

Frozen ground mechanics, Frozen ground thermodynamics, Soil pollution, Hydrocarbons, Clay soils, Soil structure, Microstructure, Ice water interface, Hydraulics, Freeze thaw cycles, Porosity, Scanning electron microscopy

## 53-3360

**Plant enhancement of indigenous soil microorganisms: a low-cost treatment of contaminated soils.**

Reynolds, C.M., et al, MP 5326, *Polar record*, Jan. 1999, 35(192), Conference on Contaminants in Freezing Ground, Cambridge, UK, July 13-15, 1997. Selected papers, p.33-40, 20 refs.

Soil pollution, Oil spills, Soil microbiology, Grasses, Roots, Biomass, Soil conservation, Revegetation, Permafrost preservation, Protective vegetation, Cost analysis

The United States has more than 1000 individual areas of petroleum-contaminated soil at formerly used defense sites located in cold regions. This paper investigates biotreatment systems based on exploiting naturally occurring phenomena in the rhizosphere—the soil adjacent to and influenced by plant roots. Rhizosphere-based remediation systems would be inexpensive to implement and maintain and would be applicable to remote or permafrost sites. This paper provides the rationale for using rhizosphere-based biotreatment systems and some initial results. In both laboratory and field studies, successful plant germination, plant growth, and root intrusion into and through contaminated soil are demonstrated. Using a Captina silt loam in a 10-week laboratory study, the effects of vegetation and contamination on microbial numbers were compared. The vegetation treatments included an unvegetated control and a vegetated treatment seeded with bahiagrass (*Paspalum notatum*). The contamination treatments included an uncontaminated control and a treatment with 2000 mg pyrene/kg soil added. Microbial numbers at 10 weeks were not significantly influenced by the contaminant level of 2000 mg pyrene/kg soil compared to the control. However, microbial numbers were greater in the rhizosphere of the bahiagrass-vegetated soil compared to the unvegetated soil. In a 34-week field study, total petroleum hydrocarbon (TPH) concentrations of a diesel-contaminated soil decreased significantly more in the rhizosphere-nutrient treatment compared to the control that was not vegetated or fertilized. Bacterial numbers in the field study were 287 times greater in the rhizosphere+nutrient treated soils than in the control treatments. Measurable TPH compounds in the plant tissue were insignificant. The data demonstrated that rhizosphere-enhanced treatment of organic-contaminated soils can be effective in reducing soil petroleum concentrations and may be a cost-effective strategy particularly suited for treating cold-region sites where remediation options are limited by cost, remoteness of the site, and/or brevity of the treatment season.

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**Modification of silt microstructure by hydrocarbon contamination in freezing ground.**

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Soil pollution, Hydrocarbons, Oil spills, Frozen ground chemistry, Clay minerals, Soil colloids, Modification, Freeze thaw cycles, Active layer, Microstructure, Porosity, Scanning electron microscopy

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**Arctic environmental cooperation in transition.**

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International cooperation, Environmental protection, Environmental impact, Organizations, Environmental tests, Economic development

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**Migration of ions of chemical elements in freezing and frozen soils.**

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**Laboratory simulation of thermal erosion: possible application to pollution problems.**

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Frozen ground thermodynamics, Frozen ground mechanics, Permafrost physics, Frozen ground temperature, Soil erosion, Water erosion, Ground thawing, Heat transfer coefficient, Mathematical models, Temperature effects

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## 53-3366

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## 53-3367

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- 53-3370**  
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- 53-3385**  
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- 53-3386**  
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53-3388

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53-3389

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53-3390

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53-3391

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53-3392

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53-3393

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53-3394

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53-3395

CH<sub>4</sub> oxidation by tundra wetlands as measured by a selective inhibitor technique.

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53-3396

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53-3397

Influence of material parameters on freeze-thaw resistance with and without deicing salt.

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53-3398

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53-3399

Laboratory and field studies of salt scaling in fly ash concrete.

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53-3400

Influence of the type of cement on the freeze-thaw resistance of the mortar phase of concrete.

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53-3401

Frost resisting and waterproof fine-grained slag ash concrete for roofs of residential structures.

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53-3402

Water resistant low water consumption plaster binder.

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53-3403

Influence of sand on the freeze-thaw resistance of the mortar phase of concrete.

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53-3404

Investigations on freeze-thaw resistance of recycling concrete.

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53-3405

Freeze-thaw resistance of concrete with recycled aggregates.

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53-3406

Frost resistance with and without deicing salt—a purely physical problem?

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53-3407

**Influence of  $C_3A$  content on frost and scaling resistance.**

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DLC TA439.1673 1997

Concrete durability, Concrete strength, Frost resistance, Salting, Damage, Concrete freezing, Phase transformations, Cement admixtures, Chemical properties, Hydrates, X ray analysis

53-3408

**Influence of cement type on resistance against freezing and thawing, with or without deicing chemicals, of cement mortar.**

Balters, U., Ludwig, U., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.111-122, 6 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete strength, Mortars, Frost resistance, Freeze thaw cycles, Cement admixtures, Classifications, Chemical composition, Scanning electron microscopy

53-3409

**Freeze-deicing salt resistance of concretes containing cement rich in slag.**

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DLC TA439.1673 1997

Concrete durability, Frost resistance, Freeze thaw cycles, Cement admixtures, Chemical composition, Salting, Degradation, Air entrainment, Freeze thaw tests

53-3410

**Frost and frost-deicing salt resistance of supersulphated cement concrete.**

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DLC TA439.1673 1997

Concrete durability, Concrete strength, Cement admixtures, Concrete aggregates, Chemical composition, Concrete curing, Frost resistance, Degradation, Salting, Freeze thaw tests

53-3411

**Sorption of chlorides on hydrated cements and  $C_3S$  pastes.**

Wowra, O., Setzer, M.J., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.146-153, 13 refs.  
DLC TA439.1673 1997

Concrete durability, Cement admixtures, Corrosion, Frost resistance, Salting, Absorption, Hydrates, Ion exchange, Chemical analysis

53-3412

**Basis of testing the freeze-thaw resistance: surface and internal deterioration.**

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DLC TA439.1673 1997

Concrete durability, Concrete strength, Frost resistance, Concrete freezing, Freeze thaw tests, Damage, Models, Mechanical tests, Standards

53-3413

**Effect of finishing, forming and curing on de-icer salt scaling resistance of concretes.**

Hooton, R.D., Boyd, A., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.174-183, 3 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete curing, Concrete placing, Degradation, Salting, Frost resistance, Freeze thaw tests, Mechanical tests

53-3414

**Influence of preconditioning on scaling resistance for different types of test surfaces.**

Utgenannt, P., Petersson, P.E., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.184-194, 7 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete aggregates, Frost resistance, Damage, Freeze thaw cycles, Freeze thaw tests, Concrete slabs, Mechanical tests, Laboratory techniques, Accuracy

53-3415

**Experimental study on frost resistance of concrete considering drying effects.**

Hama, Y., Kamada, E., Han, C.G., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.195-201, 2 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete strength, Concrete aggregates, Frost resistance, Air entrainment, Freeze thaw cycles, Freeze thaw tests, Weathering, Drying

53-3416

**Mechanism of frost damage of concrete under supercooling.**

Katsura, O., Kamada, E., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.202-211, 7 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete freezing, Supercooling, Ice crystal growth, Damage, Porosity, Capillary ice, Water pressure, Supercooling, Mathematical models

53-3417

**Length changes of concrete specimen during frost deicing salt resistance test.**

Kaufmann, J., Studer, W., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.212-221, 10 refs.  
DLC TA439.1673 1997

Concrete pavements, Concrete durability, Concrete admixtures, Surface structure, Freeze thaw cycles, Freeze thaw tests, Frost resistance, Salting, Damage, Thermal expansion

53-3418

**Moisture absorption from salt solutions in cement mortar discs during freezing.**

Lindmark, S., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.222-231, 3 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete aggregates, Mortars, Frost resistance, Concrete freezing, Damage, Salinity, Solutions, Absorption, Moisture transfer

53-3419

**Influence of water uptake during freezing and thawing.**

Auberg, R., Setzer, M.J., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.232-245, 3 refs.  
DLC TA439.1673 1997

Concrete durability, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Damage, Capillarity, Saturation, Absorption

53-3420

**Scaling and internal cracking in wet freeze/thaw testing.**

Jacobsen, S., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.246-254, 12 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete strength, Frost resistance, Freeze thaw cycles, Concrete freezing, Corrosion, Cracking (fracturing), Salting, Saturation, Absorption, Freeze thaw tests

53-3421

**Infrared thermal image characteristic and injured degree evaluation of freeze-thaw injured concrete.**

Zhang, X.O., Han, J.H., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.255-260, 2 refs.  
DLC TA439.1673 1997

Concrete durability, Frost resistance, Freeze thaw cycles, Damage, Infrared photography, Imaging, Ultrasonic tests

53-3422

**Testing of freeze-thaw resistance portland cement compositions by low temperature dilatometry.**

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DLC TA439.1673 1997

Concrete durability, Frost resistance, Concrete hardening, Cement admixtures, Solutions, Freeze thaw cycles, Freeze thaw tests, Chemical composition, Antifreezes, Freezing points

53-3423

**Reasons of damping maximums of hardened cement paste (hcp) at extremely low temperature.**

Xu, X., Setzer, M.J., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.269-280, 24 refs.  
DLC TA439.1673 1997

Cement admixtures, Elastic properties, Ice formation, Damping, Temperature effects, Porosity, Water content, Salinity, Low temperature tests

53-3424

**Subzero temperature investigation of autoclaved concrete with gypsum added.**

Adolphs, J., Setzer, M.J., Shibata, S., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.281-287, 11 refs.  
DLC TA439.1673 1997

Concrete durability, Concrete aggregates, Admixtures, Waste disposal, Construction materials, Chemical composition, Porosity, Freezing points, Elastic properties, Low temperature tests, Mechanical tests



## 53-3425

Damping measurements for nondestructive evaluation of concrete beams.

Vokes, E.A., Clarke, S.L., Janssen, D.J., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.288-297, 21 refs.

DLC TA439.1673 1997

Concrete durability, Deformation, Frost resistance, Freeze thaw cycles, Concrete slabs, Damage, Vibration, Elastic properties, Damping, Forecasting

## 53-3426

Frost failure and rapid test method of concrete frost resistance.

Panchenko, A.I., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.299-306, 2 refs.

DLC TA439.1673 1997

Concrete durability, Concrete strength, Frost resistance, Cracking (fracturing), Fatigue (materials), Stress concentration, Freeze thaw tests, Accuracy

## 53-3427

Concrete frost resistance test methods.

Rozental, N.K., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.307-313, 8 refs.

DLC TA439.1673 1997

Concrete durability, Reinforced concretes, Frost resistance, Salting, Freeze thaw tests, Freeze thaw cycles, Mechanical tests, Design criteria, Standards

## 53-3428

Temperature shock test for the determination of the freeze-thaw resistance of concrete.

Maultzsch, M., Günther, K., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.314-320, 9 refs.

DLC TA439.1673 1997

Concrete durability, Frost resistance, Freeze thaw cycles, Freeze thaw tests, Concrete freezing, Laboratory techniques, Mechanical tests, Modification, Temperature control

## 53-3429

Internal frost attack—state of the art.

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DLC TA439.1673 1997

Concrete durability, Frost resistance, Concrete freezing, Ice formation, Moisture transfer, Absorption, Frost penetration, Damage, Models, Classifications

## 53-3430

RILEM TC 117-FDC: freeze-thaw and deicing resistance of concrete; CDF test—test method for the freeze-thaw resistance of concrete; tests with sodium chloride solution (CDF). Recommendation.

Setzer, M.J., Fagerlund, G., Janssen, D.J., International RILEM Workshop on Frost Resistance of Concrete to Freezing and Thawing with or without De-icing Chemicals, Essen, Germany, Sep. 22-23, 1997. Proceedings. Edited by M.J. Setzer and R. Auberg, Suffolk, E & FN Spon, 1997, p.341-351, For another version see 52-2079.

Concrete durability, Concrete strength, Frost resistance, Damage, Antifreezes, Solutions, Freeze thaw cycles, Freeze thaw tests, Mechanical tests, Standards, Laboratory techniques

## 53-3431

Tree water relations and climatic variations at the alpine timberline: seasonal changes of sap flux and xylem water potential in *Larix decidua* Miller, *Picea abies* (L.) Karst. and *Pinus cembra* L. Anfodillo, T., Rento, S., Carraro, V., Furlanetto, L., Urbinati, C., Carrer, M., *Annales des sciences forestières*, Jan.-Feb. 1998, 55(1-2), p.159-172, With French summary. 35 refs.

Forest ecosystems, Plant physiology, Transpiration, Alpine landscapes, Forest lines, Global warming, Water supply, Water retention, Periodic variations, Meteorological factors, Trees (plants), Italy—Alps

## 53-3432

Frost formation in rotary heat and moisture exchangers.

Bilodeau, S., Brousseau, P., Lacroix, M., Mercadier, Y., *International journal of heat and mass transfer*, July 1999, 42(14), p.2605-2619, 15 refs.

Ice physics, Heat pumps, Frost, Glaze, Ice formation, Defrosting, Freeze thaw cycles, Ice vapor interface, Ice solid interface, Humidity, Mathematical models, Mass flow, Thermodynamics

## 53-3433

Prediction of  $^{137}\text{Cs}$  deposition from atmospheric nuclear weapons tests within the Arctic.

Wright, S.M., Howard, B.J., Strand, P., Nylén, T., Sickel, M.A.K., *Environmental pollution*, Jan. 1999, 104(1), p.131-143, 31 refs.

Air pollution, Polar atmospheres, Nuclear explosions, Fallout, Distribution, Precipitation (meteorology), Radioactive isotopes, Statistical analysis, Forecasting, Standards

## 53-3434

Assimilation of crustal xenoliths in a basaltic magma chamber: Sr and Nd isotopic constraints from the Hasvik Layered Intrusion, Norway.

Tegner, C., Robins, B., Reginiussen, H., Grundvig, S., *Journal of petrology*, Mar. 1999, 40(3), p.363-380, Refs. p.378-380.

Tectonics, Earth crust, Subpolar regions, Rock properties, Magma, Sedimentation, Migration, Sampling, Isotope analysis, Mineralogy, Norway

## 53-3435

Seasonal variability and mitigation options for  $\text{N}_2\text{O}$  emissions from differently managed grasslands.

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## 53-3436

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Air pollution, Soil pollution, Subpolar regions, Hydrogeochemistry, Forest ecosystems, Damage, Soil chemistry, Podzol, Aerosols, Sedimentation, Sampling, Soil profiles, Environmental impact, Russia—Kola Peninsula

## 53-3437

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## 53-3438

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Water vapor, Microwaves, Radiometry, Surface temperature, Land ice, Sea ice, Ice temperature, Cloud cover, Polar atmospheres, Remote sensing, Antarctica

## 53-3439

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Sea ice, Climatology, Models, Rheology, Air ice water interaction, Drift, Fram Strait

## 53-3440

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## 53-3441

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## 53-3442

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## 53-3443

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53-3446

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53-3447

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53-3448

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53-3450

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53-3451

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53-3452

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53-3456

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53-3461

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53-3463

**Analysis of planktic foraminiferal tests from high latitudes: indicators of climate change during the last 140,000 years. [Gehäuseuntersuchungen an planktischen Foraminiferen hoher Breiten: Hinweise auf Umweltveränderungen während der letzten 140.000 Jahre]**

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53-3464

**Changes in the  $^{18}\text{O}/^{16}\text{O}$  ratios of fluids as evidence for different metamorphic episodes in high grade gneisses from the Konovolov Mountains area (Rayner Complex, East Antarctica).**

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53-3465

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53-3467

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Pleistocene, Paleoclimatology, Climatic changes, Air temperature, Temperature variations, Atmospheric circulation, Sea ice distribution, Ice edge, Air ice water interaction, Ice cover effect, Simulation, Atlantic Ocean, Europe

53-3473

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53-3474

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53-3475

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53-3476

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53-3477

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53-3478

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53-3479

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53-3481

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53-3482

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53-3483

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53-3484

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Pleistocene, Paleogeology, Oceanography, Sea level, Subpolar regions, Plankton, Classifications, Distribution, Bottom sediment, Profiles, Drill core analysis, Statistical analysis, Beaufort Sea, Arctic Ocean

53-3485

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53-3486

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Pleistocene, Marine geology, Subpolar regions, Paleoclimatology, Paleogeology, Ocean currents, Sediment transport, Drill core analysis, Stratigraphy, Geochronology, Geochemical cycles, Arctic Ocean

53-3487

**Total volume and temporal variation of meltwater from last glacial maximum inferred from sea-level observations at Barbados and Tahiti.**

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53-3488

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53-3489

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Glacial hydrology, Snowmelt, Seasonal ablation, Meltwater, Hydrogeochemistry, Subglacial drainage, Upwelling, Runoff, Ion density (concentration), Sampling, Norway—Svalbard

53-3490

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53-3491

**Analysis of litter decomposition in an alpine tundra.**

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53-3492

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Ice physics, Ice crystal structure, Molecular structure, Latticed structures, Gases, Hydrates, Stability, Thermodynamic properties, Molecular energy levels, Analysis (mathematics)

53-3493

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Limnology, Stream flow, Glacial lakes, Ice dams, Glacial hydrology, Meltwater, Runoff, Hydrography, Insolation, Diurnal variations, Seasonal variations, Antarctica—Vestfold Hills

53-3494

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53-3495

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Marine geology, Earth crust, Subpolar regions, Seismology, Magma, Hydrothermal processes, Upwelling, Imaging, Iceland

53-3496

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**Dielectric loss mechanism of biological material during low temperature freezing.**

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53-3501

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53-3503

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53-3504

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53-3505

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Roads, Embankments, Physical properties, Permafrost beneath structures, Frozen ground temperature, Permafrost mass transfer, Permafrost thermal properties, Degradation, Boreholes, Profiles, Mathematical models, China—Qinghai-Xizang Plateau

53-3507

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Glaciology, Drill core analysis, Ice cores, Borehole instruments, Thermal drills, Core samplers, Drilling fluids, Antifreezes, Mechanical tests, Performance, Design

53-3508

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53-3509

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Glacial hydrology, Glacial geology, Rock glaciers, Cirque glaciers, Glacier ablation, Lake bursts, Flooding, Ice deterioration, Water pressure, Subglacial drainage, Reservoirs, Models, United States—California—Sierra Nevada

53-3512

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Alpine landscapes, Landforms, Geomorphology, Glacial geology, Rock glaciers, Periglacial processes, Sediment transport, Classifications, Climatic factors, Topographic effects, New Zealand—Southern Alps

53-3513

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53-3516

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53-3517

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53-3518

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53-3519

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Glacial hydrology, Glacial geology, Glacier melting, Snowmelt, Meltwater, Runoff, Ice cores, Fallout, Radioactive isotopes, Isotope analysis, Sampling, Origin, United States—Wyoming

53-3520

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53-3521

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53-3522

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53-3523

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53-3524

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53-3525

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53-3526

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53-3527

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53-3528

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53-3529

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53-3530

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Climatology, Atmospheric circulation, Cloud physics, Ice sublimation, Radar echoes, Reflectivity, Ice detection, Ice crystal optics, Gravity waves, Shear flow, Velocity measurement, Profiles, Germany

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Climatology, Air temperature, Temperature measurement, Records (extremes), Seasonal variations, Meteorological data, Statistical analysis, United States

53-3533

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Climatology, Precipitation (meteorology), Snowstorms, Synoptic meteorology, Atmospheric pressure, Turbulent boundary layer, History, Weather observations, United Kingdom—Scotland

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53-3537

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53-3538

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Ice accretion, Meltwater, Transmission lines, Electrical insulation, Leakage, Ice fog, Icing

53-3539

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Geological surveys, Glaciation, Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Soil dating, Geochronology, Paleoclimatology, Antarctica

53-3540

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Geodetic surveys, Earth crust, Continental drift, Radar tracking, Telemetry equipment, Data transmission, Data processing, Antarctica—Showa Station

53-3541

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Ice sheets, Glacier surveys, Glacier flow, Geodetic surveys, Topographic surveys, Telemetry equipment, Synthetic aperture radar, Radio echo soundings, Spaceborne photography, Antarctica—Showa Station

53-3542

**Preliminary study to generate a DEM of Amundsen Bay, Antarctica by interferometric SAR.**Doi, K., Ozawa, T., Shibuya, K., Nakagawa, H., Omura, M., Koike, K., *Polar geoscience*, Oct. 1998, No.11, National Institute of Polar Research (NIPR) Symposium on Antarctic Geosciences, 17th, Tokyo, Oct. 15-16, 1997, p.14-22, 6 refs.

Topographic surveys, Topographic maps, Synthetic aperture radar, Radio echo soundings, Height finding, Spaceborne photography, Image processing, Antarctica—Amundsen Bay

53-3543

**Geology of the Mt. Riiser-Larsen area of the Napier Complex, Enderby Land, East Antarctica.**Ishizuka, H., Ishikawa, M., Hokada, T., Suzuki, S., *Polar geoscience*, Oct. 1998, No.11, National Institute of Polar Research (NIPR) Symposium on Antarctic Geosciences, 17th, Tokyo, Oct. 15-16, 1997, p.154-171, 20 refs.

Geological surveys, Geological maps, Geologic structures, Lithology, Geochemistry, Mineralogy, Geochronology, Antarctica—Enderby Land

53-3544

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Geologic structures, Lithology, Mineralogy, Geochemistry, Geochronology, Radioactive age determination, Antarctica—Enderby Land

53-3545

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Marine geology, Marine deposits, Bottom sediment, Glaciation, Ice sheets, Ice shelves, Glacier oscillation, Glacial geology, Glacial deposits, Quaternary deposits, Drill core analysis, Soil dating, Radioactive age determination, Geochronology, Paleoclimatology, Antarctica—Ross Sea

53-3546

**Paleomagnetic study of marine sediments from antarctic sea—central Wilkes Land margin, Dumont d'Urville Sea and Victoria Land Basin.**Sakai, H., Kikawa, E., Ishihara, T., Kobayashi, H., Komori, K., Sunagawa, A., *Polar geoscience*, Oct. 1998, No.11, National Institute of Polar Research (NIPR) Symposium on Antarctic Geosciences, 17th, Tokyo, Oct. 15-16, 1997, p.222-238, 13 refs.

Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Remanent magnetism, Soil dating, Global change, Paleoclimatology, Antarctica—Wilkes Land, Antarctica—Ross Sea

53-3547

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Glaciation, Glacier oscillation, Glacial geology, Glacial deposits, Glacial till, Quaternary deposits, Pleistocene, Clay soils, Soil dating, Geochronology, Paleoclimatology, Antarctica—Enderby Land

53-3548

**Holocene lake sediments and sea-level change at Mt. Riiser-Larsen.**Zwart, D.P., Miura, H., Takada, M., Moriwaki, K., *Polar geoscience*, Oct. 1998, No.11, National Institute of Polar Research (NIPR) Symposium on Antarctic Geosciences, 17th, Tokyo, Oct. 15-16, 1997, p.249-259, 20 refs.

Marine geology, Marine deposits, Lacustrine deposits, Bottom sediment, Quaternary deposits, Core samplers, Soil dating, Sea level, Isostasy, Global change, Paleoclimatology, Antarctica—Riiser-Larsen, Mount

53-3549

**Late Quaternary East Antarctic melting event in the Soya Coast region based on stratigraphy and oxygen isotopic ratio of fossil molluscs.**Miura, H., Maemoku, H., Seto, K., Moriwaki, K., *Polar geoscience*, Oct. 1998, No.11, National Institute of Polar Research (NIPR) Symposium on Antarctic Geosciences, 17th, Tokyo, Oct. 15-16, 1997, p.260-274, 25 refs.

Marine geology, Marine deposits, Quaternary deposits, Fossils, Ice sheets, Glacier melting, Meltwater, Outwash, Geochronology, Soil dating, Paleoclimatology, Antarctica—Lützow-Holm Bay

53-3550

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Mars (planet), Extraterrestrial ice, Geocryology, Ground ice, Regolith, Landforms, Volcanoes, Magma, Ice solid interface, Geomorphology, Theories, Models

53-3551

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Pleistocene, Glacial geology, Glacial deposits, Paleogeology, Sea level, Subsidence, Stratigraphy, Isostasy, Ice volume, United States—New Mexico—San Andreas Mountains

53-3552

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Pleistocene, Quaternary deposits, Geomorphology, Glacial geology, Ice sheets, Glacier oscillation, Glacial erosion, Subglacial drainage, Glacial deposits, Sedimentation, Drill core analysis, Stratigraphy, Radioactive age determination, Isostasy, Norway—Jæren

53-3553

**Interglacial and glacial climate oscillations in a marine shelf sequence from northern Denmark—a multidisciplinary study.**Kristensen, P., Knudsen, K.L., Lykke-Andersen, H., Nørmark, E., Peacock, J.D., Sinnott, A., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.813-837, Refs. p.835-837.

Paleoclimatology, Quaternary deposits, Glacial geology, Paleogeology, Glacier oscillation, Sedimentation, Drill core analysis, Stratigraphy, Lithology, Luminescence, Geochronology, Denmark



53-3554

**Pollen stratigraphy of Late Pleistocene marine sediments at Nørre Lyngby and Skagen, north Denmark.**

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Pleistocene, Paleoclimatology, Paleobotany, Vegetation patterns, Quaternary deposits, Marine deposits, Palynology, Drill core analysis, Stratigraphy, Pollen, Classifications, Denmark

53-3555

**Pleistocene pollen stratigraphy from borehole 81/34, Devil's Hole area, central North Sea.**

Ekman, S.R., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.855-869, 62 refs.

Pleistocene, Marine geology, Quaternary deposits, Marine deposits, Paleobotany, Palynology, Vegetation patterns, Pollen, Classifications, Boreholes, Stratigraphy, Geochronology, North Sea

53-3556

**Middle Pleistocene shallow marine interglacial sequence, Inner Silver Pit, southern North Sea: pollen and dinoflagellate cyst stratigraphy and sea-level history.**

Scourse, J.D., Ansari, M.H., Wingfield, R.T.R., Harland, R., Balson, P.S., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.871-900, Refs. p.897-900.

Pleistocene, Sea level, Marine geology, Glacial geology, Glacial erosion, Quaternary deposits, Marine deposits, Paleobotany, Palynology, Stratigraphy, Seismic reflection, Isostasy, North Sea

53-3557

**Middle Pleistocene glacial-interglacial succession in the Inner Silver Pit, southern North Sea: foraminiferal stratigraphy and amino acid geochronology.**

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Pleistocene, Quaternary deposits, Glacial geology, Glacier oscillation, Marine geology, Paleocology, Stratigraphy, Geochronology, Correlation, North Sea

53-3558

**Paleoecology and geochemistry of shallow marine ostracoda from the Sand Hole formation, Inner Silver Pit, southern North Sea.**

Ingram, C., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.913-929, Refs. p.927-929.

Pleistocene, Paleoclimatology, Quaternary deposits, Marine deposits, Paleocology, Palynology, Boreholes, Stratigraphy, Geochemistry, Isotope analysis, North Sea

53-3559

**Middle Pleistocene pollen biostratigraphy in the central North Sea.**

Ekman, S.R., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.931-944, 62 refs.

Pleistocene, Marine deposits, Quaternary deposits, Glacial deposits, Paleocology, Palynology, Vegetation patterns, Boreholes, Stratigraphy, Correlation, North Sea

53-3560

**Palynology, aminostratigraphy and U-series dating of marine Gortian interglacial sediments in Cork Harbour, southern Ireland.**

Dowling, L.A., Sejrup, H.P., Coxon, P., Heijnis, H., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.945-962, Refs. p.960-962.

Pleistocene, Quaternary deposits, Clays, Paleocology, Palynology, Classifications, Boreholes, Stratigraphy, Radioactive age determination, Geochronology, Ireland

53-3561

**Variability in surface and deep water conditions in the Nordic seas during the last interglacial period.**

Fronval, T., Jansen, E., Hafliðason, H., Sejrup, H.P., *Quaternary science reviews*, Sep. 1998, 17(9-10), p.963-985, Refs. p.979-981.

Pleistocene, Paleoclimatology, Oceanography, Quaternary deposits, Marine deposits, Ocean currents, Water temperature, Ventilation, Ice rafting, Paleocology, Stratigraphy, Isotope analysis, Norwegian Sea, Iceland Sea, Greenland Sea

53-3562

**Ice and snow-type classification in the Vestfold Hills, East Antarctica, using Landsat-TM data and ground radiometer measurements.**

Borešjö Bronge, L., Bronge, C., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.225-240, 25 refs.

Snow surveys, Snow surface, Glacier surfaces, Spaceborne photography, Radiometry, LANDSAT, Spectra, Classifications, Image processing, Colored ice, Metamorphism (snow), Antarctica—Vestfold Hills

53-3563

**Atlas of Antarctica north of 72.1°S from GEO-SAT radar altimeter data.**

Herzfeld, U.C., Matassa, M.S., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.241-258, 42 refs.

Geophysical surveys, Height finding, Glacier surveys, Geodetic surveys, Topographic surveys, Radar echoes, Spacecraft, Sensor mapping, Glacier mass balance, Statistical analysis, Maps, Antarctica

53-3564

**Comparison of annual changes in winter ERS-1 SAR images and glacier mass balance of Slakbreen, Svalbard.**

Engeset, R.V., Ødegård, R.S., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.259-271, 16 refs.

Spaceborne photography, Synthetic aperture radar, Glacier surveys, Glacier mass balance, Surface properties, Seasonal variations, Backscattering, Profiles, Image processing, Norway—Svalbard

53-3565

**Glacier mapping of the Illecillewaet Icefield, British Columbia, Canada, using Landsat TM and digital elevation data.**

Sidjak, R.W., Wheate, R.D., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.273-284, 19 refs.

Spaceborne photography, LANDSAT, Glacier surveys, Glacier surfaces, Topographic features, Sensor mapping, Height finding, Classifications, Image processing, Canada—British Columbia—Glacier National Park

53-3566

**Use of coincident DMSP SSM/I and OLS satellite data to improve snow cover detection and discrimination.**

Standley, A.P., Barrett, E.C., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.285-305, 15 refs.

Spaceborne photography, Snow surveys, Snow cover structure, Radiometry, Precipitation (meteorology), Cloud cover, Snow cover structure, Classifications, Accuracy, Resolution, Image processing, Norway

53-3567

**Geostatistical interpolation and classification of remote sensing data from ice surfaces.**

Herzfeld, U.C., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.307-327, 42 refs.

Geophysical surveys, Ice sheets, Glacier surveys, Ice surface, Glacier surges, Height finding, Spaceborne photography, Synthetic aperture radar, Image processing, Classifications, Statistical analysis, United States—Alaska—Bering Glacier, Antarctica—Lambert Glacier

53-3568

**Airborne line scanner measurements for ERS-1 SAR interpretation of sea ice.**

Bochert, A., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.329-348, 38 refs.

Spaceborne photography, Sea ice, Ice surveys, Synthetic aperture radar, Ice surface, Image processing, Classifications, Resolution

53-3569

**Multifrequency scatterometer measurements of Baltic Sea ice during EMAC-95.**

Dierking, W., Pettersson, M.I., Askne, J., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.349-372, 37 refs.

Remote sensing, Sea ice, Ice structure, Radar echoes, Backscattering, Classifications, Ice water interface, Snow ice interface, Snow cover effect, Mathematical models, Baltic Sea

53-3570

**Ice cover discrimination in the Greenland waters using first-order texture parameters of ERS SAR images.**

Gill, R.S., Valeur, H.H., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.373-385, 17 refs.

Spaceborne photography, Synthetic aperture radar, Sea ice, Surface structure, Young ice, Ice openings, Fast ice, Classifications, Image processing, Filters, Statistical analysis, Greenland

53-3571

**Summer environmental mapping potential of a large-scale ERS-1 SAR mosaic of the state of Alaska.**

Li, S.S., et al., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.387-401, 32 refs.

Geophysical surveys, Spaceborne photography, Sensor mapping, Synthetic aperture radar, Image processing, Terrain identification, Resolution, United States—Alaska

53-3572

**Rock-type discrimination by field TM and SPOT data, Tarn Flat, Antarctica.**

Casacchia, R., Mazzarini, F., Salvatori, R., Salvini, F., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.403-420, 24 refs.

Geological surveys, Lithology, Glacial deposits, Sensor mapping, Rock properties, Classifications, Spaceborne photography, LANDSAT, Radiometry, Reflectivity, Image processing, Antarctica—Victoria Land

53-3573

**Landsat TM mapping of evidence for current wind activity in northern Fennoscandia.**  
Käyhkö, J., Vuorela, A., Pye, K., Worsley, P., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.421-443, 64 refs.  
Geophysical surveys, Soil surveys, Spaceborne photography, LANDSAT, Eolian soils, Forest soils, Sensor mapping, Sediment transport, Subpolar regions, Wind factors, Image processing, Classifications, Finland, Sweden

53-3574

**Estimation of the soil heat flux/net radiation ratio based on spectral vegetation indexes in high-latitude arctic areas.**

Jacobsen, A., Hansen, B.U., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.445-461, 33 refs.

Soil surveys, Subpolar regions, Tundra soils, Vegetation patterns, Radiometry, Spaceborne photography, Heat flux, Radiation balance, Biomass, Indexes (ratios), Spectra, Greenland—Zackenbergl

53-3575

**Mapping plant communities in a local arctic landscape applying a scanned infrared aerial photograph in a geographical information system.**

Nilsen, L., Brossard, T., Joly, D., *International journal of remote sensing*, Jan. 20, 1999, 20(2), Circumpolar Symposium on Remote Sensing of the Polar Environments, 4th, Lyngby, Denmark, Apr. 29-May 1, 1996. Selected papers. Edited by P. Gudmandsen, p.463-480, 24 refs.

Sensor mapping, Spaceborne photography, Subpolar regions, Infrared photography, Vegetation patterns, Ecosystems, Classifications, Image processing, Norway—Svalbard

53-3576

**Motorized snow vehicle.**

Bibollett, J.C., Isambert, A., *U.S. Patent Office. Patent*, Apr. 25, 1989, n.p., USP-4,823,903.  
Motor vehicles, Snow removal equipment, Road maintenance

53-3577

**Snow plow alignment and storage system.**

Pester, W.D., *U.S. Patent Office. Patent*, Apr. 18, 1989, n.p., USP-4,821,435.  
Motor vehicles, Snow removal equipment, Road maintenance

53-3578

**Headwear with face tunnel for cold weather environment.**

Clanton, J.M., Harlow, J., Phillips, J.G., Jr., *U.S. Patent Office. Patent*, Apr. 25, 1989, n.p., USP-4,823,407.  
Clothing, Cold weather performance

53-3579

**Investigations of explosives and their conjugated transformation products in biotreatment matrices.**

Thorne, P.G., Leggett, D.C., SR 99-03, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Feb. 1999, 12p., ADA-361 904, 27 refs.

Explosives, Soil pollution, Land reclamation

Samples of soil that had been aerobically composted or anaerobically digested were extracted with solvent, then hydrolyzed with base and then acid. The concentrations of extractable TNT and its monoamino and diamino transformation products fell rapidly after the first days of treatment. Hydrolysis of the solvent-extracted residues released significant quantities of intact transformation products. The concentrations of RDX and HMX were reduced in a similar fashion without the appearance of significant quantities of transformation products. A generalized approach to biotreatment matrices analyses was developed. Spike-recovery studies indicated that analyses of bioremediation matrices should be considered as a qualitative descriptor of the progress of humification and the capacity to covalently conjugate transformation products rather than as a quantitative measure of the absolute amounts of various analytes present.

53-3580

**Validation of automated cloud top phase algorithms: distinguishing between cirrus clouds and snow in a priori analyses of AVHRR imagery.**

Hutchison, K.D., Etherton, B.J., Topping, P.C., *Optical engineering*, June 1997, 36(6), p.1727-1737, 11 refs.

Clouds (meteorology), Snow cover effect, Radiometry, Synthetic aperture radar, Image processing, Spaceborne photography, Albedo, Reflectivity, Brightness, Ice detection

53-3581

**Substrate induced crystallization of amorphous solid water at low temperatures.**

Dohnálek, Z., Ciolli, R.L., Kimmel, G.A., Stevenson, K.P., Smith, R.S., Kay, B.D., *Journal of chemical physics*, Mar. 22, 1999, 110(12), p.5489-5492, 20 refs.

Ice physics, Amorphous ice, Phase transformations, Low temperature research, Ice crystal growth, Spectra

53-3582

**Look at Canada's provincial and territorial geological surveys.**

Boon, J., *Geoscience Canada*, Dec. 1998, 25(4), p.145-170, With French summary. 6 refs.

Geological surveys, Organizations, Research projects, History, Canada

53-3583

**Neutron scattering by heavy water and ice under hydrostatic pressure of argon.**

Malenkov, G.G., Averkiev, A.A., Bobrowicz-Sarga, L., Bragin, S.I., Natkaniec, I., Smirnov, L.S., *Crystallography reports*, Jan.-Feb. 1999, 44(1), p.62-68, Translated from *Kristallografiia*. 36 refs.

Neutron scattering, Heavy water, High pressure tests, High pressure ice, Clathrates, Hydrates

53-3584

**Brittle compressive failure of orthotropic ice under triaxial loading.**

Schulson, E.M., Gratz, E.T., *Acta materialia*, Feb. 5, 1999, 47(3), p.745-755, 51 refs.

Ice physics, Ice mechanics, Ice strength, Compressive properties, Brittleness, Loads (forces), Ice deformation, Thin sections, Salt ice, Stress strain diagrams

53-3585

**Particle size account in electron probe x-ray microanalysis of solid sediments in snow cover.**

Belozeroval, O.I.U., Finkel'shtein, A.L., Pavlova, L.A., Barankevich, V.G., *Journal of analytical chemistry*, Jan. 1999, 54(1), p.24-27, Translated from *Zhurnal analiticheskoi khimii*. 10 refs.

Snow cover, X ray analysis, Microanalysis, Particle size distribution, Accuracy, Sediments

53-3586

**Detection of the structure of the wing of the Rayleigh line in ice, water, and heavy water using four-photon polarization spectroscopy.**

Andreeva, N.P., Bunkin, A.F., Nurmatov, A.A., *JETP letters*, Jan. 10, 1999, 69(1), p.11-14, Translated from *Pis'ma v zhurnal ékspierimental'noi teoreticheskoi fiziki*. 9 refs.

Spectra, Spectroscopy, Water structure, Heavy water, Ice structure, Ice physics

53-3587

**Seasonal spatial and diurnal variation in chemical composition of snow, ice and melt water from Naradu Glacier.**

Kalsotra, B.L., Sheikh, H.N., *Indian journal of environmental protection*, May 1996, 16(5), p.365-372, 32 refs.

Ice composition, Glacier ice, Meltwater, Snow composition, Seasonal variations, Glacial hydrology, Water chemistry, India—Himalaya Mountains

53-3588

**Ice physics and the natural environment.**

Wettlaufer, J.S., ed, Dash, J.G., ed, Untersteiner, N., ed, NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings and NATO ASI, Series I. Global Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, 355p., Refs. passim. For individual papers see 53-3589 through 53-3617.

DLC QC926.32.I25 1999

Ice physics, Sea ice, Glacier ice, Geocryology, Ice melting, Extraterrestrial ice, Ice composition, Pollution, Environmental protection, Ice water interface, Ice crystal growth, Theories

53-3589

**History of the search for a theory of melting.**

Dash, J.G., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.11-21, 33 refs.

DLC QC926.32.I25 1999

Ice physics, Ice melting, Molecular energy levels, Vibration, Ice surface, Surface properties, Ice water interface, Adsorption, Phase transformations, Theories, Thermodynamics

53-3590

**Nucleation and surface melting of ice.**

Oxtoby, D.W., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.23-38, 43 refs.

DLC QC926.32.I25 1999

Ice physics, Ice melting, Melting points, Ice surface, Molecular energy levels, Ice water interface, Phase transformations, Homogeneous nucleation, Analysis (mathematics), Theories, Thermodynamics

53-3591

**Crystal growth, surface phase transitions and thermomolecular pressure.**

Wettlaufer, J.S., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.39-67, Refs. p.64-67.

DLC QC926.32.I25 1999

Ice physics, Ice melting, Ice crystal growth, Ice crystal structure, Anisotropy, Phase transformations, Ice surface, Vapor pressure, Ice water interface, Surface roughness, Thermodynamics, Analysis (mathematics)

53-3592

**Some aspects of the physics of glaciers.**

Paterson, W.S.B., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.69-88, 38 refs.

DLC QC926.32.I25 1999

Ice physics, Glacier flow, Ice mechanics, Ice deformation, Glacier surges, Unsteady flow, Calving, Ice rafting, Glacier mass balance, Pleistocene, Analysis (mathematics)

## 53-3593

**Stable isotope records from Greenland deep ice cores: the climate signal and the role of diffusion.**

Johnsen, S.J., Clausen, H.B., Jouzel, J., Schwander, J., Sveinbjörnsdóttir, A.E., White, J., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.89-107, Refs. p.103-107.

DLC QC926.32.I25 1999

Pleistocene, Paleoclimatology, Climatic changes, Air temperature, Ice sheets, Ice cores, Vapor diffusion, Self diffusion, Isotope analysis, Profiles, Mathematical models, Greenland

## 53-3594

**Present and past glaciations: a geological perspective.**

Birkenmajer, K., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.109-119, 38 refs.

DLC QC926.32.I25 1999

Pleistocene, Paleoclimatology, Glaciation, Glacier oscillation, Glacial geology, Geochronology, Ice age theory, Antarctica

## 53-3595

**Ice in the troposphere.**

Baker, M.B., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.121-142, 92 refs.

DLC QC926.32.I25 1999

Climatology, Ice physics, Cloud physics, Ice sublimation, Ice vapor interface, Ice crystal growth, Particles, Ice nuclei, Impurities, Heterogeneous nucleation, Cloud electrification, Charge transfer

## 53-3596

**Physico-chemistry of polar stratospheric clouds.**

Peter, T., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.143-167, 67 refs.

DLC QC926.32.I25 1999

Climatology, Cloud physics, Phase transformations, Ozone, Polar stratospheric clouds, Chemical properties, Particles, Aerosols, Ice vapor interface, Heterogeneous nucleation

## 53-3597

**Minimal model of sea ice and climate.**

Thorndike, A., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.169-183, 4 refs.

DLC QC926.32.I25 1999

Climatology, Global warming, Greenhouse effect, Sea ice, Air temperature, Air ice water interaction, Albedo, Ice cover effect, Radiation balance, Advection, Mathematical models

## 53-3598

**Forecasting ice on lakes, estuaries and shelf seas.**

Omstedt, A., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.185-207, 27 refs.

DLC QC926.32.I25 1999

Ice forecasting, Lake ice, River ice, Sea ice, Estuaries, Air ice water interaction, Surface temperature, Ice formation, Cooling rate, Ice cover effect, Mathematical models, Thermodynamics

## 53-3599

**On productivity in ice-covered polar oceans.**

Lønne, O.J., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.209-218, 31 refs.

DLC QC926.32.I25 1999

Marine biology, Ecosystems, Biomass, Algae, Ice water interface, Ice bottom surface, Sea ice distribution, Ice formation, Drift, Ice cover effect

## 53-3600

**Freezing of soils: ice in a porous medium and its environmental significance.**

Williams, P.J., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.219-239, 36 refs.

DLC QC926.32.I25 1999

Geocryology, Soil freezing, Frost heave, Frozen ground mechanics, Porosity, Microstructure, Unfrozen water content, Capillarity, Thermodynamic properties, Soil conservation

## 53-3601

**Ground freezing technology for environmental remediation.**

Dash, J.G., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.241-251, 23 refs.

DLC QC926.32.I25 1999

Geocryology, Soil pollution, Radioactive wastes, Leaching, Thermal diffusion, Artificial freezing, Cryogenic structures, Linings, Waste treatment, Soil conservation, Environmental protection

## 53-3602

**Nuclear contamination and environmental damage from oil spills in polar regions of FSU.**

Popova, L., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.253-271, 18 refs.

DLC QC926.32.I25 1999

Air pollution, Soil pollution, Subpolar regions, Nuclear explosions, Fallout, Radioactive wastes, Oil spills, Damage, Environmental impact, Environmental protection, International cooperation, Arctic Ocean, Barents Sea, Russia—Kara Sea

## 53-3603

**Lecture notes on water in ice: microscopic and geophysical scales.**

Nye, J.F., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.273-279, 21 refs.

DLC QC926.32.I25 1999

Ice physics, Glacier ice, Glacial hydrology, Lake bursts, Ice water interface, Freezing points, Analysis (mathematics)

## 53-3604

**Local ice deformation under the influence of natural forces. Field observations and analyses of cyclic oscillations.**

Aksenov, E., Wadhams, P., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.281-284, 10 refs.

DLC QC926.32.I25 1999

Oceanography, Sea ice, Water waves, Gravity waves, Ice mechanics, Ice water interface, Ice deformation, Oscillations, Spectra

## 53-3605

**Corrugations of the sea-ice-ocean interface caused by ocean shear.**

Feltham, D.L., Worster, M.G., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.285-287, 7 refs.

DLC QC926.32.I25 1999

Oceanography, Sea ice, Ice mechanics, Pressure ridges, Ice bottom surface, Permeability, Surface roughness, Topographic features, Air ice water interaction, Shear flow, Turbulent flow

## 53-3606

**Climatic changes in the mountain glacier area of Pamir.**

Finaev, A., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.289-294, 8 refs.

DLC QC926.32.I25 1999

Climatology, Climatic changes, Glacial hydrology, Mountain glaciers, Glacier ablation, Air temperature, Statistical analysis, Tajikistan, CIS—Central Asia, Pamirs, Pamir-Alay

## 53-3607

**Geometric selection in ice polycrystals: concavity, faceting, and kinetics.**

Hodgkin, V.A., Wettlaufer, J.S., Dash, J.G., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.295-297, 3 refs.

DLC QC926.32.I25 1999

Ice physics, Ice microstructure, Ice crystal growth, Ice crystal structure, Ice water interface, Topographic features, Mechanical tests

53-3608

**Snowpack accumulation trends in California.**

Johnson, T., Dozier, J., Michaelson, J., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.299-304, 6 refs.

DLC QC926.32.I25 1999

Precipitation (meteorology), Snow hydrology, Snow accumulation, Altitude, Seasonal variations, Snow courses, Sampling, Statistical analysis, United States—California

53-3609

**Neutron spectroscopy of vapour deposited amorphous ice.**

Kolesnikov, A.I., Li, J.C., NATO Advanced Research Workshop on Ice Physics in the Natural and Endangered Environment, Maratea, Italy, Sep. 1997. Proceedings. Ice physics and the natural environment. Edited by J.S. Wettlaufer et al and NATO ASI, Series I. Global and Environmental Change. Vol.56, Berlin, Springer-Verlag, 1999, p.305-307, 14 refs.

DLC QC926.32.I25 1999

Ice physics, Amorphous ice, Ice vapor interface, Adsorption, Ice density, Ice spectroscopy, Neutron scattering

53-3610

**Comet 46P/Wirtanen: the influence of grain sintering on the evolution layer.**

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DLC QC926.32.I25 1999

Extraterrestrial ice, Satellites (natural), Surface properties, Ice physics, Ice composition, Dust, Vapor diffusion, Ice sublimation, Sintering, Porosity, Models

53-3611

**Water ice as the main component of icy satellites.**

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DLC QC926.32.I25 1999

Extraterrestrial ice, Satellites (natural), Ice physics, Regolith, Ice composition, Porosity, Phase transformations, Rheology, Models

53-3612

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DLC QC926.32.I25 1999

Precipitation (meteorology), Cloud physics, Thunderstorms, Cloud electrification, Ice crystal growth, Particles, Ice melting, Ice crystal collision, Mass transfer, Simulation

53-3613

**Mathematical model of wide subglacial water drainage channels.**

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DLC QC926.32.I25 1999

Glacial hydrology, Subglacial drainage, Ice water interface, Turbulent flow, Glacier beds, Channels (waterways), Mathematical models

53-3614

**High uptake efficiency and conductivity of polycrystalline ice: implication to UT/LS clouds and contrails.**

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DLC QC926.32.I25 1999

Cloud physics, Condensation trails, Polar stratospheric clouds, Heterogeneous nucleation, Aerosols, Ice vapor interface, Simulation

53-3615

**Methane bubble inclusions in ice on high latitude lakes.**

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DLC QC926.32.I25 1999

Lake ice, Ice composition, Bubbles, Nucleation, Natural gas, Gas inclusions, Ice cores, Drill core analysis, Seasonal variations

53-3616

**Modelling sea ice roughness in the Arctic.**

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DLC QC926.32.I25 1999

Sea ice, Ice physics, Ice mechanics, Surface roughness, Pressure ridges, Distribution, Ice deformation, Statistical analysis, Models

53-3617

**Dynamical calculations for the proton ordered ice II structure.**

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DLC QC926.32.I25 1999

Ice physics, Molecular structure, Hydrogen bonds, Protons, Molecular energy levels, Ice spectroscopy, Neutron scattering, Spectra

53-3618

**Using the temporal variability of satellite radar altimetric observations to map surface properties of the antarctic ice sheet.**

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Glacier surveys, Spaceborne photography, Height finding, Sensor mapping, Ice sheets, Surface properties, Topographic features, Radar echoes, Attenuation, Grain size, Snow cover structure, Antarctica

53-3619

**Satellite gravity and the mass balance of the antarctic ice sheet.**

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Geophysical surveys, Glacier mass balance, Ice sheets, Glacier surveys, Glacier thickness, Isostasy, Gravity, Snow accumulation, Spacecraft, Correlation, Antarctica

53-3620

**Physical and chemical studies in the region of the southern slope of Mount Elbrus, Caucasus.**

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Mountain glaciers, Glacier ice, Impurities, Fallout, Aerosols, Ice composition, Snow composition, Ice cores, Stratigraphy, Ice microstructure, Ion density (concentration), Chemical analysis, Russia—Caucasus

53-3621

**Basal sliding of Ice Stream B, West Antarctica.**

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Glacier flow, Basal sliding, Shear flow, Ice solid interface, Ice mechanics, Boreholes, Markers, Velocity measurement, Oscillations, Models, Antarctica—Ross Ice Shelf, Antarctica—West Antarctica

53-3622

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Glacial hydrology, Mountain glaciers, Glacier mass balance, Glacier melting, Solar radiation, Radiance, Photometry, Seasonal variations, Albedo, Ice optics, Models, Switzerland—Morteratschgletscher

53-3623

**Reconnaissance study of glacier energy balance in North Greenland, 1993-94.**

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53-3624

**Comparisons of sea-ice velocity fields from ERS-1 SAR and a dynamic model.**

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Sea ice, Ice mechanics, Drift, Velocity measurement, Ice deformation, Air ice water interaction, Spaceborne photography, Radiometry, Synthetic aperture radar, Rheology, Ice models, Mathematical models, Baltic Sea

53-3625

**Geometric evolution and ice dynamics during a surge of Bakaninbreen, Svalbard.**

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Glacier surges, Glacier flow, Glacier oscillation, Velocity measurement, Dynamic properties, Strains, Shear stress, Ice mechanics, Profiles, Radio echo soundings, Norway—Svalbard

53-3626

**Isotopic diffusion in polar firn: implications for interpretation of seasonal climate parameters in ice-core records, with emphasis on central Greenland.**

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Paleoclimatology, Climatic changes, Ice sheets, Firn, Ice cores, Water vapor, Vapor diffusion, Isotope analysis, Analysis (mathematics), Seasonal variations, Snow air interface, Greenland

- 53-3627**  
**Stability of a viscous till sheet coupled with ice flow, considered at wavelengths less than the ice thickness.**  
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- 53-3628**  
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Glacial geology, Glacial till, Geomorphology, Glacier flow, Viscous flow, Sediment transport, Ice solid interface, Plastic deformation, Rheology, Analysis (mathematics), Theories
- 53-3629**  
**Mass balance of glaciers other than the ice sheets.**  
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Glacier surveys, Glacier mass balance, Glacier oscillation, Seasonal variations, Statistical analysis, Simulation, Forecasting, Accuracy
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Glaciology, Firn, Structural analysis, Ice microstructure, Ice crystal size, Microrelief, Porosity, Bubbles, Imaging, Reflectivity, Photographic techniques, Photointerpretation
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- 53-3632**  
**Detection of abrupt changes in glacier mass balance in the Tien Shan Mountains.**  
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Mountain glaciers, Glacier mass balance, Glacier oscillation, Seasonal variations, Meteorological factors, Climatic changes, Air temperature, Statistical analysis, China—Tian Shan, China—Urumqi Glacier No.1, Kazakhstan—Tuyuksu Glacier, CIS—Tien Shan
- 53-3633**  
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Glacial hydrology, Glacier flow, Velocity measurement, Basal sliding, Subglacial drainage, Water pressure, Ice water interface, Diurnal variations, Sweden—Storglaciären
- 53-3634**  
**Comparison of a three-dimensional model for glacier flow with field data from Haut Glacier d'Arolla, Switzerland.**  
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- 53-3635**  
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Glacier flow, Glacial hydrology, Glacier beds, Basal sliding, Ice solid interface, Shear stress, Water pressure, Velocity, Mathematical models
- 53-3636**  
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Glacier oscillation, Glacier melting, Glacier mass balance, Mountain glaciers, Glacier flow, Velocity, Profiles, Climatic changes, Global warming, Temperature effects, Mathematical models, Switzerland—Rhonegletscher
- 53-3637**  
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- 53-3638**  
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Spaceborne photography, Synthetic aperture radar, Ice sheets, Glacier flow, Glacier oscillation, Ice edge, Ice shelves, Ice breakup, Ice deformation, Calving, Aggregates, Antarctica—Ronne Ice Shelf, Antarctica—Filchner Ice Shelf
- 53-3639**  
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Ice sheets, Ice shelves, Glacier flow, Calving, Ice edge, Surface structure, Aggregates, Mechanical properties, Spaceborne photography, Synthetic aperture radar, Simulation, Correlation, Antarctica—Filchner Ice Shelf, Antarctica—Ronne Ice Shelf
- 53-3640**  
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Glaciology, Glacial hydrology, Subglacial drainage, Hydrogeology, Borehole instruments, Electrical measurement, Electrical resistivity, Imaging, Design, Switzerland—Haut Glacier d'Arolla
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Pleistocene, Paleoclimatology, Oceanography, Marine deposits, Paleocology, Biomass, Sea ice distribution, Ice melting, Sedimentation, Radioactive age determination, Geochronology, Stratigraphy, Drill core analysis, Antarctica—Ross Sea
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- 53-3644**  
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Paleocology, Forest lines, Tundra vegetation, Nutrient cycle, Quaternary deposits, Lacustrine deposits, Geochemical cycles, Organic soils, Carbon isotopes, Soil analysis, Russia—Taymyr Peninsula
- 53-3645**  
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Paleocology, Forest lines, Subarctic landscapes, Migration, Vegetation patterns, Peat, Palynology, Quaternary deposits, Climatic factors, Geochronology, Sweden
- 53-3646**  
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Paleoclimatology, Climatic changes, Ocean currents, Marine deposits, Paleocology, Biomass, Ice cores, Correlation, Drill core analysis, Geochronology, Greenland, Antarctica—Antarctic Peninsula
- 53-3647**  
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Climatology, Climatic changes, Global change, Surface temperature, Temperature variations, Insolation, Solar radiation, Radiation absorption, Periodic variations, Sea ice distribution, Ice cover effect, Simulation
- 53-3649**  
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Climatology, Polar atmospheres, Surface temperature, Storms, Atmospheric circulation, Atmospheric pressure, Air ice water interaction, Sea ice distribution, Ice edge, Ice cover effect, Radiometry, Indian Ocean, Antarctica—Weddell Sea, Antarctica—Ross Sea

## 53-3650

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Climatology, Polar atmospheres, Ice sheets, Glacier mass balance, Altitude, Water content, Ice cores, Seasonal variations, Sampling, Statistical analysis, Isotope analysis, Forecasting, Greenland

## 53-3651

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Climatology, Polar atmospheres, Cloud physics, Phase transformations, Polar stratospheric clouds, Air temperature, Seasonal variations, Sounding, Statistical analysis, Forecasting

## 53-3652

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Climatology, Marine atmospheres, Polar atmospheres, Radiation balance, Infrared radiation, Radiance, Radiation absorption, Water vapor, Spectra, Radiometry, Photometry, Arctic Ocean

## 53-3653

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Precipitation (meteorology), Cloud physics, Radiation balance, Scattering, Polarization (waves), Radiometry, Attenuation, Snow pellets, Falling snow, Orientation, Snow optics, Models

## 53-3654

**Lidar and numerical studies on the different evolution of vortex pair and secondary wake in young contrails.**

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Climatology, Cloud physics, Condensation trails, Fluid dynamics, Turbulent diffusion, Heterogeneous nucleation, Ice crystal growth, Ice sublimation, Supersaturation, Lidar, Mathematical models

## 53-3655

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Climatology, Aerosols, Distribution, Polar atmospheres, Structural analysis, Stratosphere, Seasonal variations, Aerial surveys, Spectroscopy, Profiles, Statistical analysis

## 53-3656

**Proceedings of the Second International Conference on Concrete under Severe Conditions; CONSEC '98; Environment and loading.**

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## 53-3657

**Performance of fiber-reinforced cement composites exposed to acid and deicers.**

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Reinforced concretes, Concrete durability, Concrete admixtures, Adhesion, Leaching, Permeability, Degradation, Freeze thaw cycles, Cold weather performance, Cold weather tests, Protection

## 53-3658

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Concrete durability, Reinforced concretes, Concrete slabs, Concrete admixtures, Air entrainment, Compressive properties, Frost resistance, Freeze thaw tests, Salting, Permeability, Degradation, Cold weather tests

## 53-3659

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Concrete durability, Degradation, Frost resistance, Concrete admixtures, Frost action, Freeze thaw cycles, Air entrainment, Degradation, Protection, Specifications

## 53-3660

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Concrete durability, Frost action, Degradation, Frost resistance, Salting, Chemical ice prevention, Damage, Ultrasonic tests, Freeze thaw tests, Laboratory techniques

## 53-3661

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## 53-3662

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Dams, Frost resistance, Concrete aggregates, Concrete durability, Elastic properties, Freeze thaw cycles, Freeze thaw tests, Moisture transfer, Water cement ratio, Mechanical tests

## 53-3663

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Concrete durability, Concrete aggregates, Mortars, Frost action, Damage, Freeze thaw cycles, Freeze thaw tests, Strain tests, Porosity, Unfrozen water content

## 53-3664

**Effects of freezing rate on the strains and ice formation in concrete mortar.**

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Concrete durability, Concrete admixtures, Mortars, Concrete freezing, Freezing rate, Ice formation, Air entrainment, Freeze thaw tests, Strain tests, Humidity

## 53-3665

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Dams, Electric power, Reinforced concretes, Concrete durability, Concrete strength, Floating ice, Damage, Frost resistance, Frost action, Freeze thaw cycles, Russia—Siberia

## 53-3666

**Reliable testing of resistance of concrete against frost attack with CIF test.**

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Concrete durability, Frost action, Frost resistance, Damage, Corrosion, Air entrainment, Freeze thaw cycles, Freeze thaw tests, Standards, Accuracy, Laboratory techniques

## 53-3667

**Freeze-deicing salt resistance of high-strength concrete.**

Stark, J., Chelouah, N., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.1. Environment and loading. Edited by O.E. Gjorv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.586-595, 8 refs.

Concrete durability, Reinforced concretes, Cement admixtures, Frost resistance, Salting, Capillarity, Water cement ratio, Hydrates, Freeze thaw cycles, Phase transformations, Chemical composition

## 53-3668

**Russian experience with marine concrete structures at the Kislaya Guba tidal power station.**

Stepanova, V.F., Rozental, N.K., Kondratova, I.L., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.1. Environment and loading. Edited by O.E. Gjorv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.596-605, 14 refs.

Dams, Hydraulic structures, Frost resistance, Subpolar regions, Concrete durability, Cement admixtures, Classifications, Freeze thaw cycles, Design criteria, Standards, Russia—Murmansk



53-3669

**Effectiveness of ultrasonic wave velocity as a method to evaluate frost damage to concrete.**

Yamashita, H., Sakai, H., Saeki, N., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.1. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.708-716, 4 refs.  
Concrete durability, Concrete structures, Frost action, Freeze thaw cycles, Damage, Surface roughness, Ultrasonic tests, Sound waves, Velocity, Attenuation, Correlation

53-3670

**Effectiveness of the coating and admixing system against AAR combined with deicer or sulfates attack.**

Yang, D.B., Fang, S.X., Tang, M.S., Xu, Z.Z., Deng, M., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.1. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.717-725, 8 refs.

Concrete durability, Concrete admixtures, Coatings, Protection, Mortars, Salting, Chemical ice prevention, Corrosion, Degradation, Saturation, Chemical analysis

53-3671

**Effect of quality of concrete on the scaling deterioration due to calcium chloride.**

Shimada, H., Sakai, K., Abe, K., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.2. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1251-1260, 7 refs.

Concrete durability, Concrete pavements, Cement admixtures, Physical properties, Porosity, Frost resistance, Salting, Degradation, Corrosion, Freeze thaw cycles, Freeze thaw tests

53-3672

**Selection of offshore production structures for the arctic environment.**

Løset, S., Gudmestad, O.T., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1556-1565, 14 refs.

Petroleum industry, Offshore structures, Oil wells, Caissons, Stability, Protection, Icebergs, Ice loads, Design criteria, Structural analysis, Surface properties, Russia, Barents Sea

53-3673

**Creep of heat-cured high-performance concrete subjected to freezing or elevated temperature.**

Persson, B.S.M., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1616-1626, 11 refs.

Concrete durability, Concrete strength, Concrete freezing, Reinforced concretes, Concrete curing, Chemical composition, Creep, Mathematical models, Loading, Rheology, Low temperature tests

53-3674

**Current status of durability design for concrete structures in Japan.**

Sugiyama, T., Tsuji, Y., Kuroi, T., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1675-1683, 4 refs.

Concrete durability, Indexes (ratios), Concrete structures, Frost resistance, Frost action, Freeze thaw tests, Specifications, Design, Cold weather performance

53-3675

**Influence of sub-zero temperature on fracture properties of plain and synthetic fiber reinforced concretes.**

Dubey, A., Banthia, N., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1798-1808, 24 refs.

Concrete durability, Reinforced concretes, Concrete admixtures, Polymers, Chemical composition, Mechanical properties, Mechanical tests, Loading, Cracking (fracturing), Nucleation, Low temperature tests

53-3676

**Freezing behavior and strength development of concrete containing antifreezer under freezing conditions.**

Hama, Y., Kamada, E., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1846-1854, 3 refs.

Winter concreting, Concrete durability, Concrete strength, Concrete admixtures, Concrete freezing, Antifreezes, Saturation, Unfrozen water content, Frost resistance, Electrical measurement, Porosity

53-3677

**Effects of antifreezing admixture and aggregate quality on concrete under cold environment.**

Hosokawa, Y., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1874-1883, 8 refs.

Concrete durability, Winter concreting, Concrete strength, Concrete curing, Frost action, Frost resistance, Antifreezes, Concrete admixtures, Concrete aggregates, Freeze thaw tests, Mechanical tests

53-3678

**Durability, strength development and cost effectiveness of concretes containing up to 85% fly ash.**

Johnston, C.D., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1932-1941, 6 refs.

Concrete durability, Bridges, Concrete strength, Concrete aggregates, Cement admixtures, Salinity, Permeability, Chemical composition, Frost resistance, Freeze thaw cycles, Mechanical tests, Cost analysis

53-3679

**Modern methods of accelerating the hardening of concrete at below-zero temperature.**

Krylov, B.A., Zvezdov, A.I., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1952-1962, 5 refs.

Concrete durability, Winter concreting, Concrete placing, Concrete hardening, Concrete heating, Frost action, Frost resistance, Electric heating

53-3680

**Effect of silica fume addition on the frost-salt scaling resistance of aged concrete.**

Matala, S.P., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.1989-1998, 8 refs.

Concrete durability, Concrete admixtures, Chemical composition, Concrete curing, Frost resistance, Frost action, Degradation, Salinity, Porosity, Temperature measurement

53-3681

**Durability of self-compacting and low heat high performance concrete.**

Sakata, K., Ayano, T., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.2057-2064, 4 refs.

Concrete durability, Reinforced concretes, Mechanical properties, Viscosity, Rheology, Compaction, Compressive properties, Freeze thaw tests, Frost resistance, Mechanical tests

53-3682

**Measurement of chloride flow along highway.**

Tang, L., Utgenannt, P., International Conference on Concrete under Severe Conditions, 2nd, Trondheim, Norway, June 21-24, 1998. Proceedings, Vol.3. Environment and loading. Edited by O.E. GjØrv, K. Sakai and N. Banthia, London, E & FN Spon, 1998, p.2113-2122, 1 ref.

Roads, Environmental tests, Winter maintenance, Salting, Antifreezes, Salinity, Runoff, Ion diffusion, Sampling, Samplers, Performance, Sweden

53-3683

**CRREL Ice Jam Database.**

White, K.D., Eames, H.J., CR 99-02, U.S. Army Cold Regions Research and Engineering Laboratory. Report, Feb. 1999, 17p., ADA-362 147, 38 refs.

Ice jams, Flooding, River ice, Data processing, History, United States

This report provides information on the CRREL Ice Jam Database and its potential use for analyzing ice-related flooding problems. Rivers in the northern United States are subject to ice jams that cause flooding; block hydropower and water supply intakes; delay or stop navigation; damage riverine structures such as locks, dams, bridges, dikes, levees, and wingwalls; and decrease downstream discharge. The lack of readily available information on historical ice events hinders rapid, effective response to ice jam flooding and other ice-related damage. The CRREL Ice Jam Database was developed to provide a centralized record of ice events.

53-3684

**Effect of dissolved NaCl on freezing curves of kaolinite, montmorillonite, and sand pastes.**

Grant, S.A., Boitnott, G.E., Tice, A.R., SR 99-02, U.S. Army Cold Regions Research and Engineering Laboratory. Special report, Jan. 1999, 28p., ADA-360 406, 34 refs.

Soil freezing, Unfrozen water content, Capillarity, Nuclear magnetic resonance, Analysis (mathematics), Thermodynamics, Liquid phases, Freezing points, Solid phases

The authors developed a chemical-thermodynamic procedure for calculating the capillary pressures of aqueous NaCl solutions in a porous medium at temperatures below 0°C by extending the treatment by Brun et al. (1977). Ice in the porous medium was assumed to be a pure phase with thermophysical properties identical to bulk hexagonal ice. The thermophysical properties (and the attendant derivative and integral properties) of the electrolyte solutions were calculated with the Pitzer model as parameterized by Archer (1992). Experiments were conducted to test this procedure. Pastes of kaolinite clay, montmorillonite, and quartz sand were prepared by washing repeatedly with aqueous solutions of 0.1-, 0.01- and 0.001-mol/kg NaCl. The molar unfrozen water contents of these pastes were measured by pulsed nuclear magnetic resonance (NMR) in the temperature range -0.14°C to -66.6°C. The relationships between ice-solution capillary pressures and specific solution volumes for frozen pastes of each mineral were plotted for all initial solution molalities. While some systematic errors were evident, these plots indicated that the capillary pressure-volume relationships were consistent for pastes of the three minerals and, as expected from theory, unaffected by initial equilibrating solution molality.

53-3685

**CRREL South Pole Tunneling System.**

Walsh, M.R., CR 99-01, U.S. Army Cold Regions Research and Engineering Laboratory. Report, Jan. 1999, 22p., ADA-362 137, 12 refs.

Tunneling (excavation), Snow tunnels, Design, Cold weather operation, Cold weather construction, Equipment, Machinery, Cold weather tests, Antarctica—Amundsen-Scott Station

Facilities operations in a polar ice cap environment present many challenges. Coping with the extreme cold temperatures, associated wind chills, darkness during the long winter months, and blowing and drifting snow all hamper installation, maintenance and repair. For over 40 years, the concept of using tunnels for utilities and personnel has been tried with mixed results. In 1991, the U.S. Army Cold Regions Research and Engineering Laboratory initiated a project to design, develop, fabricate, test, build, and deploy a system for the machining of unlined tunnels at the Amundsen-Scott South

Pole Station. The tunneling system as configured during the Jan. 1996 deployment was capable of operating at a maximum sustained production rate (>4 hr) of 1.5 m/hr for a 2x3x16-m tunnel. The maximum operating depth was approximately 16 m from surface to the tunnel floor. The maximum length tunneled during one shift was 13 m, and the maximum one-day progress was 21.3 m. The system is described in this report, along with suggestions to improve the current technology.

### 53-3686

#### Mapping the boundary between continuous and discontinuous permafrost in Alaska.

England, A.W., U.S. Geological Survey. *Water Resources Division. Report*, Aug. 29, 1995, 25p., PB98-115819, Refs. p.22-25.

Continuous permafrost, Discontinuous permafrost, Brightness, Temperature distribution, Soil water, Frozen ground, Mathematical models, Dielectric properties, Tundra soils, Radiometry, Mapping, Surface temperature, United States—Alaska

### 53-3687

#### Anti-icing study: controlled chemical treatments.

Alger, R.G., Adams, E.E., Beckwith, E.P., *U.S. Strategic Highway Research Program. Report*, Apr. 1994, SHRP-H-683, 145p., PB94-182540, 2 refs.

Chemical ice prevention, Road icing, Road maintenance, Computer applications, Pavements, Safety

### 53-3688

#### Survey of anti-icing practice in Virginia.

Roosevelt, D.S., U.S. Federal Highway Administration. *Virginia Division. Report*, Nov. 1997, FHWA/VTRC-98-R19, 17p., PB98-123201, 4 refs.

Ice removal, Snow removal, Road maintenance, Cold weather operation, Surveys, United States—Virginia

### 53-3689

#### Cost-effective microwave sensing of highway road conditions.

Kubichek, R.F., Yoakum-Stover, S., U.S. Federal Highway Administration. *Transportation Research Board. IDEA program*, Apr. 1998, TRB/NCHRP-ID031, 18p., PB98-141187, 12 refs.

Remote sensing, Roads, Road icing, Pavements, Microwaves, Slush, Snow accumulation, Accuracy, Antennas, Cost analysis

### 53-3690

#### Global warming and marine carbon cycle feedbacks on future atmospheric CO<sub>2</sub>.

Joos, F., Plattner, G.K., Stocker, T.F., Marchal, O., Schmittner, A., *Science*, Apr. 16, 1999, 284(5413), p.464-467, 31 refs.

Global warming, Carbon dioxide, Sea water, Atmospheric composition, Air water interactions, North Atlantic Ocean

### 53-3691

#### Palynology of a 250-m core from Lake Biwa: a 430,000-year record of glacial-interglacial vegetation change in Japan.

Miyoshi, N., Fujiki, T., Morita, Y., *Review of palaeobotany and palynology*, Feb. 1999, 104(3-4), p.267-283, 24 refs.

Pleistocene, Palynology, Vegetation patterns, Paleoclimatology, Drill core analysis, Japan—Biwa, Lake

### 53-3692

#### Changes in meridional temperature and salinity gradients in the North Atlantic Ocean (30°-72°N) during the last interglacial period.

Cortijo, E., Lehman, S., Keigwin, L., Chapman, M., Paillard, D., Labeyrie, L., *Paleoceanography*, Feb. 1999, 14(1), p.23-33, 40 refs.

Isotope analysis, Drill core analysis, Oxygen isotopes, Sea water, Surface temperature, Water temperature, Salinity, Temperature gradients, Insolation, Paleoclimatology, Ice volume, Plankton, Ocean bottom, Oceanography, North Atlantic Ocean

### 53-3693

#### Paleoclimatic significance of eolian carbonates supplied to the Japan Sea during the last glacial maximum.

Oba, T., Pedersen, T.F., *Paleoceanography*, Feb. 1999, 14(1), p.34-41, 75 refs.

Paleoclimatology, Bottom sediment, Plankton, Carbon dioxide, Air water interactions, Radioactive age determination, Dust, Eolian soils, Drill core analysis, Japan, Sea

### 53-3694

#### 1.0 Myr record of Glacial North Atlantic Intermediate Water variability from ODP site 982 in the northeast Atlantic.

Venz, K.A., Hodell, D.A., Stanton, C., Warnke, D.A., *Paleoceanography*, Feb. 1999, 14(1), p.42-52, 55 refs.

Carbon isotopes, Ocean currents, Pleistocene, Paleoclimatology, Sea ice distribution, Ice cover effect, Ice volume, Oxygen isotopes, Oceanography, North Atlantic Ocean

### 53-3695

#### Biogeochemistry of antarctic sea ice: a case study on platelet ice layers at Drescher Inlet, Weddell Sea.

Günther, S., Gleitz, M., Dieckmann, G.S., *Marine ecology progress series*, Feb. 11, 1999, Vol.177, p.1-13, 65 refs.

Sea ice, Geochemistry, Nutrient cycle, Biomass, Marine biology, Ecosystems, Algae, Chlorophylls, Ice water interface, Antarctica—Weddell Sea

### 53-3696

#### Determination of arctic ice algal production with a new *in situ* incubation technique.

Mock, T., Grading, R., *Marine ecology progress series*, Feb. 11, 1999, Vol.177, p.15-26, Refs. p.24-26.

Algae, Chlorophylls, Biomass, Nutrient cycle, Sea ice, Marine biology, Growth, Brines, Ice temperature, Acclimatization, Barents Sea, Greenland Sea, Antarctica

### 53-3697

#### Younger Dryas (Loch Lomond Stadial) jökulhlaup deposit, Fort Augustus, Scotland.

Russell, A.J., Marren, P.M., *Boreas*, Dec. 1998, 27(4), p.231-242, 45 refs.

Geomorphology, Flooding, Lake bursts, Ice dams, Glacial lakes, Pleistocene, Glacial hydrology, Meltwater, United Kingdom—Scotland

### 53-3698

#### 800-year long, radiocarbon-dated varve chronology from south-eastern Sweden.

Wohlfarth, B., Björck, S., Possnert, G., Holmquist, B., *Boreas*, Dec. 1998, 27(4), p.243-257, 27 refs.

Glacial deposits, Radioactive age determination, Correlation, Ice dams, Glacial lakes, Fossils, Clays, Sweden

### 53-3699

#### Comparative study of striations and basal till clast fabrics, Malpeque-Bedeque region, Prince Edward Island, Canada.

Catto, N.R., *Boreas*, Dec. 1998, 27(4), p.259-274, 76 refs.

Glacial till, Striations, Glacial deposits, Glacier flow, Bedrock, Glacial geology, Canada—Prince Edward Island

### 53-3700

#### New data from the Holsteinian interglacial site Öje, central Sweden.

García Ambrosiani, K., Robertsson, A.M., *Boreas*, Dec. 1998, 27(4), p.289-295, 34 refs.

Fossils, Pollen, Stratigraphy, Palynology, Sediments, Paleobotany, Paleoclimatology, Sweden

### 53-3701

#### Active ice-sheet deglaciation and ice-dammed lakes in the northern Cairngorm Mountains, Scotland.

Brazier, V., Kirkbride, M.P., Gordon, J.E., *Boreas*, Dec. 1998, 27(4), p.297-310, 52 refs.

Geomorphology, Paleoclimatology, Glacial geology, Meltwater, Ice dams, Glacial lakes, Glacial deposits, Lacustrine deposits, Mountain glaciers, United Kingdom—Scotland

### 53-3702

#### Modelling northern hemisphere ice volume over the last 3 Ma.

Berger, A., Li, X.S., Loutre, M.F., *Quaternary science reviews*, Jan. 1999, 18(1), p.1-11, 55 refs.

Paleoclimatology, Models, Carbon dioxide, Ice volume, Ice cover, Climatic changes, Oxygen isotopes, Ice air interface, Insolation, Spectra

### 53-3703

#### Comparison of the lichenometric and Schmidt hammer dating techniques based on data from the proglacial areas of some Icelandic glaciers.

Evans, D.J.A., Archer, S., Wilson, D.J.H., *Quaternary science reviews*, Jan. 1999, 18(1), p.13-41, 40 refs.

Lichens, Glacial geology, Geomorphology, Age determination, Precipitation (meteorology), Climatic factors, Moraines, Outwash, Rock glaciers, Iceland

### 53-3704

#### Ribbed moraine formation.

Hättestrand, C., Kleman, J., *Quaternary science reviews*, Jan. 1999, 18(1), p.43-61, 99 refs.

Moraines, Glacial till, Pressure ridges, Glacier flow, Geomorphology, Glacial geology, Sweden

### 53-3705

#### Modern and last local glacial maximum snowlines in the Central Andes of Peru, Bolivia, and Northern Chile.

Klein, A.G., Seltzer, G.O., Isacks, B.L., *Quaternary science reviews*, Jan. 1999, 18(1), p.63-84, Refs. p.82-84.

Snow line, Paleoclimatology, Mapping, Isotherms, Glacier mass balance, Pleistocene, Mountain glaciers, LANDSAT, Andes, Peru, Bolivia, Chile

### 53-3706

#### Holocene glacier and climate fluctuations on Franz Josef Land, Arctic Russia, 80°N.

Lubinski, D.J., Forman, S.L., Miller, G.H., *Quaternary science reviews*, Jan. 1999, 18(1), p.85-108, Refs. p.105-108.

Climatic changes, Paleoclimatology, Glacier surveys, Temperature effects, Air temperature, Radioactive age determination, Glacier oscillation, Moraines, Russia—Franz Josef Land

### 53-3707

#### East Asian monsoon variation during the last 130,000 years: evidence from the Loess Plateau of central China and Lake Biwa of Japan.

Xiao, J.L., et al., *Quaternary science reviews*, Jan. 1999, 18(1), p.147-157, 35 refs.

Loess, Paleoclimatology, Eolian soils, Sediments, Lacustrine deposits, Dust, China—Loess Plateau, Japan—Biwa, Lake

### 53-3708

#### Space at the Service of Our Environment; Proceedings of the 3rd ERS Symposium.

ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997, Guyenne, T.D., ed, Danes, D., ed, Noordwijk, European Space Agency, 1997, 3 vols. (1,917p.), ESA SP-414, Refs. passim. For selected papers see 53-3709 through 53-3762.

DLC QE33.2.A7 E785 1997 Vol.1, Vol.2, Vol.3  
Spaceborne photography, Synthetic aperture radar, Radiometry, Sensor mapping, Geophysical surveys, Image processing, Remote sensing, Polar atmospheres, Sea ice

## 53-3709

**Detecting soil thawing in Siberia with ERS scatterometer and SAR.**

Boehnke, K., Wismann, V., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.35-40, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Geocryology, Geophysical surveys, Arctic landscapes, Ground thawing, Detection, Altitude, Spaceborne photography, Synthetic aperture radar, Radiometry, Seasonal variations, Models, Russia—Siberia

## 53-3710

**Merging of elevations from SAR interferometry, satellite altimetry, GPS and laser altimetry in Greenland.**

Nielsen, C.S., Forsberg, R., Ekholm, S., Mohr, J.J., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.415-420, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Glacier surveys, Topographic surveys, Spaceborne photography, Synthetic aperture radar, Lasers, Sensor mapping, Height finding, Correlation, Resolution, Greenland

## 53-3711

**Investigation of ERS SAR data of the tandem mission for planning and monitoring of Siberian pipeline tracks.**

Streck, C., Wegmüller, U., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.441-447, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Gas pipelines, Arctic landscapes, Taiga, Freeze thaw cycles, Active layer, Surface structure, Deformation, Geophysical surveys, LANDSAT, Spaceborne photography, Synthetic aperture radar, Radiometry, Sensor mapping, Russia—Siberia

## 53-3712

**SAR ERS imagery for the study of relationships between tectonics and volcanism: examples in Iceland and Anatolia.**

Chorowicz, J., et al, ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.463-467, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Spaceborne photography, Geophysical surveys, Geomorphology, Subpolar regions, Tectonics, Volcanoes, Sensor mapping, Synthetic aperture radar, Correlation, Iceland

## 53-3713

**ERS-tandem-interferometric observation of volcanic activities in Iceland.**

Thiel, K.H., Wu, X.Q., Hartl, P., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.475-480, ESA SP-414, 5 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Geophysical surveys, Subpolar regions, Volcanoes, Sensor mapping, Magma, Glacier melting, Geothermal thawing, Synthetic aperture radar, Spaceborne photography, Iceland—Vatnajökull

## 53-3714

**Flood mapping from phase decorrelation of tandem ERS data: Ob' River, Siberia.**

Smith, L.C., Alsdorf, D.E., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.537-539, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Geophysical surveys, Floodplains, Lakes, Subpolar regions, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Wind factors, Backscattering, Image processing, Resolution, Russia—Siberia

## 53-3715

**Recent interdisciplinary research in the neovolcanic zone of Iceland using SAR data.**

Münzer, U., Jónsson, S., Einarsson, P., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.1, Noordwijk, European Space Agency, 1997, p.549-553, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.1

Geophysical surveys, Volcanoes, Glacier surfaces, Deformation, Glacier melting, Geothermal thawing, Subpolar regions, Synthetic aperture radar, Spaceborne photography, Lake bursts, Iceland—Vatnajökull

## 53-3716

**Ozone profile retrieval from GOME satellite data II: validation and applications.**

Eichmann, K.U., et al, ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.755-758, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Climatology, Atmospheric composition, Polar atmospheres, Ozone, Remote sensing, Sounding, Radiance, Backscattering, Profiles

## 53-3717

**Survey of tropical cirrus particle size and shape using ATSR-2 visible/near-infrared data.**

Watts, P.D., Baran, A.J., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.773-778, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Climatology, Cloud physics, Ice crystal optics, Radiometry, Ice crystal size, Particle size distribution, Light scattering, Cloud height indicators, Probes

## 53-3718

**Comparison of microwave backscatter measurements with observed roughness of the snow surface in East Queen Maud Land, Antarctica.**

Furukawa, T., Young, N.W., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.803-807, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Geophysical surveys, Glacier surveys, Glacier surfaces, Snow optics, Radiometry, Backscattering, Surface roughness, Anisotropy, Topographic effects, Microrelief, Correlation, Antarctica—Queen Maud Land

## 53-3719

**Validation of energy balance estimates from snow covered areas of the Antarctic Peninsula based on ERS-PRI images.**

Schneider, C., Wunderle, S., Gossmann, H., Saurer, H., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.809-814, ESA SP-414, 11 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Snow hydrology, Glacier surfaces, Synthetic aperture radar, Spaceborne photography, Radiance, Heat balance, Snowmelt, Snow cover structure, Seasonal variations, Models, Antarctica—Antarctic Peninsula

## 53-3720

**Ice discharge from north and northeast Greenland using ERS data.**

Rignot, E., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.815-818, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Geophysical surveys, Ice sheets, Glacier thickness, Glacial hydrology, Glacier melting, Spaceborne photography, Radar echoes, Glacier mass balance, Calving, Greenland

## 53-3721

**Velocities of Pine Island and Thwaites glaciers, West Antarctica, from ERS-1 SAR images.**

Lucchitta, B.K., Rosanova, C.E., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.819-824, ESA SP-414, 20 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Glacier flow, Spaceborne photography, Synthetic aperture radar, Velocity measurement, Seasonal variations, Antarctica—West Antarctica

## 53-3722

**Five years of AMI-Wind sea ice backscatter grids on a CD-ROM.**

Gohin, F., Maroni, C., Cavané, A., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.825-829, ESA SP-414, 15 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice surveys, Spaceborne photography, Backscattering, Seasonal variations, Data processing, Computer applications, Computer programs, Imaging, Antarctica—Weddell Sea, Arctic Ocean

## 53-3723

**Characteristic snow and ice properties of a Norwegian ice cap determined from complex ERS SAR.**

Kelly, R.E.J., Engeset, R., Kennett, M., Barrett, E.C., Theakstone, W., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.831-836, ESA SP-414, 13 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Glacier surfaces, Glacier mass balance, Snow cover structure, Snow line, Synthetic aperture radar, Sensor mapping, Spaceborne photography, Seasonal variations, Norway

## 53-3724

**Topography estimation in W. Antarctica directly from level 2 radar altimeter data.**

Stenoien, M., Bentley, C.R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.837-842, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Topographic surveys, Ice sheets, Height finding, Slope orientation, Radar echoes, Models, Simulation, Accuracy, Topographic effects, Antarctica—West Antarctica

## 53-3725

**Digital elevation model of the Greenland ice sheet and validation with airborne laser altimeter data.**

Bamber, J.L., Ekholm, S., Krabill, W.B., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.843-847, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Surface roughness, Topographic effects, Slope orientation, Geodetic surveys, Lasers, Height finding, Models, Correlation, Accuracy, Greenland

## 53-3726

**Antarctic ice sheet dynamics derived from ERS-1 precise topography.**

Rémy, F., Legrésy, B., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.849-852, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Glacier flow, Glacier mass balance, Spacecraft, Topographic surveys, Radar echoes, Sensor mapping, Topographic maps, Rheology, Antarctica

53-3727

**Derivation of glacial catchments of the Antarctic Peninsula by means of interferometric techniques.**

Wunderle, S., Saurer, H., Goßmann, H., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.853-856, ESA SP-414, 8 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Glacier oscillation, Glacier flow, Velocity measurement, Synthetic aperture radar, Spacecraft, Image processing, Antarctica—Antarctic Peninsula

53-3728

**Monitoring snow properties on Greenland with ERS scatterometer and SAR.**

Wismann, V., Boehnke, K., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.857-861, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Snow surveys, Snow cover structure, Snow hydrology, Snowmelt, Metamorphism (snow), Sensor mapping, Radiometry, Synthetic aperture radar, Radar echoes, Backscattering, Greenland

53-3729

**Ice velocity at the ice front of the Filchner-Ronne Ice Shelf, Antarctica, as observed with ERS interferometry.**

Rignot, E., MacAyeal, D.R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.863-866, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Spaceborne photography, Synthetic aperture radar, Ice shelves, Glacier flow, Velocity measurement, Glacier thickness, Surface properties, Ice deformation, Image processing, Models, Correlation, Antarctica—Ronne Ice Shelf, Antarctica—Filchner Ice Shelf

53-3730

**Satellite data synergies for monitoring arctic ice masses.**

Bingham, A.W., Rees, W.G., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.867-870, ESA SP-414, 12 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Glacier mass balance, Glacier oscillation, Snow line, Sensor mapping, Height finding, Seasonal variations, Spaceborne photography, Synthetic aperture radar, Norway—Svalbard

53-3731

**Multi-source snow cover monitoring in eastern Switzerland.**

Piesbergen, J., Holecz, F., Haefner, H., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.871-875, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Snow surveys, Snow cover distribution, Mountains, Sensor mapping, LANDSAT, Spaceborne photography, Synthetic aperture radar, Backscattering, Snow line, Image processing, Switzerland

53-3732

**SAR data exploitation for monitoring antarctic ice sheets and glaciers.**

Müller, U., Sievers, J., Walter, H., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.877-879, ESA SP-414, 1 ref.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice shelves, Glacier flow, Glacier mass balance, Tidal currents, Sensor mapping, Spaceborne photography, Synthetic aperture radar, Antarctica

53-3733

**ERS SAR retrieval of ice cover parameters from some oil and gas fields on the Russian arctic shelf.**

Melent'ev, V.V., et al, ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.881-885, ESA SP-414.

DLC QE33.2.A7 E785 1997 Vol.2

Ice surveys, Sea ice, Surface structure, Ice shelves, Sensor mapping, Gas pipelines, Subpolar regions, Spaceborne photography, Synthetic aperture radar, Economic development, Russia—Kara Sea, Barents Sea

53-3734

**Antarctic ice sheet snow properties derived from ERS altimeter data.**

Legresy, B., Remy, F., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.887-890, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Glacier mass balance, Snow cover structure, Surface roughness, Radar echoes, Backscattering, Radiometry, Height finding, Data processing, Antarctica

53-3735

**ATSR data and hydrodynamic models to investigate physical processes in Lake Baikal, Siberia.**

Le Core, H., Llewellyn-Jones, D., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.891-894, ESA SP-414, 5 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Remote sensing, Spaceborne photography, Hydrodynamics, Lake ice, Ice detection, Surface structure, Ice cover thickness, Snow cover, Albedo, Brightness, Image processing, Resolution, Russia—Baykal, Lake

53-3736

**Detecting changes in ice movement in the antarctic ice sheet by SAR interferometry.**

Frolich, R.M., Doake, C.S.M., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.895-898, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Glacier flow, Glacier oscillation, Shear flow, Detection, Velocity measurement, Spaceborne photography, Synthetic aperture radar, Image processing, Antarctica

53-3737

**Comparison of ERS altimeter and GPS heights on the Amery Ice Shelf, East Antarctica.**

Phillips, H.A., Hyland, G., Morgan, P., Coleman, R., Young, N., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.899-904, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Geophysical surveys, Glacier surveys, Ice shelves, Topographic surveys, Height finding, Radar echoes, Data processing, Profiles, Accuracy, Antarctica—Amery Ice Shelf

53-3738

**ICEWATCH-real-time sea ice monitoring of the Northern Sea Route using satellite radar technology.**

Johannessen, O.M., et al, ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.907-916, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Subpolar regions, Ice surveys, Sea ice distribution, Marine transportation, Ice navigation, Ice reporting, Route surveys, Spaceborne photography, Synthetic aperture radar, Classifications, Sensor mapping, Barents Sea, Russia—Kara Sea

53-3739

**Observation of sea-ice and ice-free structures in the Bransfield Strait and southern Drake Passage with ERS-1/SAR.**

Capdevila, J., Corbera, J., Calvet, J., Puigdefabregas, J., Arnau, P., Garcia, M.A., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.917-921, ESA SP-414, 5 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Surface structure, Spaceborne photography, Synthetic aperture radar, Ice deformation, Image processing, Backscattering, Air ice water interaction, Antarctica—Bransfield Strait, Drake Passage

53-3740

**Sea ice displacement measured by ERS-1 SAR interferometry.**

Dammert, P.B.G., Leppäranta, M., Askne, J., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.923-930, ESA SP-414, 17 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice surveys, Ice mechanics, Ice deformation, Pressure ridges, Topographic features, Spaceborne photography, Synthetic aperture radar, Sensor mapping, Baltic Sea

53-3741

**Floe sizes in the east antarctic sea ice zone estimated using combined SAR and field data.**

Lytle, V.I., Massom, R., Worby, A.P., Allison, I., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.931-936, ESA SP-414, 11 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice floes, Classifications, Spaceborne photography, Synthetic aperture radar, Image processing, Backscattering, Antarctica—East Antarctica

53-3742

**Study of the temporal nature of arctic leads during spring using ERS-1 SAR.**

Onstott, R.G., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.937-941, ESA SP-414, 2 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Pack ice, Ice cover thickness, Ice openings, Ice edge, Detection, Spaceborne photography, Synthetic aperture radar, Beaufort Sea

53-3743

**Estimation of wind, wave and ice parameters at the ice boundary by using active microwave systems of the ERS satellites.**

Lehner, S., Schulz-St., J., Bamler, R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.943-948, ESA SP-414, 11 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Spaceborne photography, Synthetic aperture radar, Ice edge, Ice cover thickness, Air ice water interaction, Ocean waves, Spectra, Image processing, Greenland

53-3744

**Mesoscale sea ice dynamics in the Weddell Sea.**

Thomas, M., Roth, R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.949-953, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice surveys, Drift, Spaceborne photography, Synthetic aperture radar, Image processing, Statistical analysis, Antarctica—Weddell Sea

## 53-3745

**Measuring changes of iceberg attitudes by SAR interferometry.**

Thomas, M., Steffens, M., Roth, R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.955-958, ESA SP-414, 2 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Icebergs, Orientation, Mechanical properties, Spaceborne photography, Synthetic aperture radar, Image processing

## 53-3746

**Use of ocean wave imaging to detect the marginal ice zone in ERS-SAR images.**

Schmidt, R., Heygster, G., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.959-962, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice edge, Ocean waves, Wave propagation, Ice water interface, Spaceborne photography, Synthetic aperture radar, Image processing, Spectra, Antarctica—Bellingshausen Sea

## 53-3747

**Regional characteristics of sea level variation in the southern ocean with relation to antarctic sea ice.**

Chen, G., Ezraty, R., He, M.X., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.963-966, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea level, Sea ice distribution, Ice water interface, Ice cover effect, Heat flux, Remote sensing, Radar echoes, Height finding, Statistical analysis, Antarctica—Ross Sea, Antarctica—Weddell Sea

## 53-3748

**Radar ice motion interferometry.**

Goldstein, R., Werner, C., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.969-972, ESA SP-414, 4 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Spaceborne photography, Radar echoes, Glacier flow, Image processing, Data processing, Filters, Greenland

## 53-3749

**Interferometric estimation of ice sheet motion and topography.**

Joughin, I., Kwok, R., Fahnestock, M., Winebrenner, D., Tulaczyk, S., Gogineni, P., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.973-977, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Ice sheets, Glacier flow, Velocity measurement, Spaceborne photography, Radar echoes, Topographic surveys, Image processing, Data processing, Greenland

## 53-3750

**Interferometric study of the ice stream in interior northeast Greenland.**

Fahnestock, M., Joughin, I., Kwok, R., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.979-982, ESA SP-414, 8 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glaciology, Glacier surveys, Geophysical surveys, Ice sheets, Glacier flow, Sensor mapping, Spaceborne photography, Synthetic aperture radar, Image processing, Greenland

## 53-3751

**Interferometric SAR for observation of glacier motion and firn penetration.**

Winebrenner, D.P., Joughin, I.R., Fahnestock, M.A., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.983-987, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glaciology, Ice sheets, Firn stratification, Glacier flow, Spaceborne photography, Synthetic aperture radar, Topographic surveys, Height finding, Image processing, Backscattering, Models, Greenland

## 53-3752

**ERS tandem study of glacier dynamics in NE-Greenland.**

Mohr, J.J., Madsen, S.N., Reeh, N., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.989-993, ESA SP-414, 8 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glaciology, Ice sheets, Glacier flow, Velocity measurement, Spaceborne photography, Synthetic aperture radar, Image processing, Topographic features, Data processing, Greenland

## 53-3753

**Dynamic behavior of the Bering Glacier-Bagley Icefield system during a surge, and other measurements of Alaskan glaciers with ERS SAR imagery.**

Lingle, C.S., Fatland, D.R., Voronina, V.A., Ahlén, K., Troshina, E.N., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.995-1000, ESA SP-414, 14 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glaciology, Glacier surveys, Mountain glaciers, Glacier surges, Velocity measurement, Snow line, Sensor mapping, Spaceborne photography, Synthetic aperture radar, Image processing, United States—Alaska

## 53-3754

**Experiments at CCRS using ERS tandem mode data.**

Gray, A.L., Mattar, K.E., Geudtner, D., Vachon, P.W., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.1001-1006, ESA SP-414, 10 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Geophysical surveys, Sensor mapping, Arctic landscapes, Mountain glaciers, Glacier flow, Spaceborne photography, Synthetic aperture radar, Image processing, Topographic features, Accuracy, Canada—Saskatchewan, Canada—Northwest Territories—Bathurst Island

## 53-3755

**Applications of time series of microwave backscatter over the antarctic region.**

Young, N.W., Hyland, G., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.1007-1014, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Geophysical surveys, Snow surveys, Glacier surveys, Spaceborne photography, Backscattering, Icebergs, Drift, Snow cover distribution, Snow cover effect, Image processing, Antarctica—Amery Ice Shelf

## 53-3756

**ERS satellite microwave radar observations of antarctic sea-ice dynamics.**

Drinkwater, M.R., Liu, X., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.1109-1114, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Oceanography, Sea ice distribution, Ice formation, Polynyas, Pack ice, Drift, Radar tracking, Air ice water interaction, Spaceborne photography, Synthetic aperture radar, Antarctica—Weddell Sea

## 53-3757

**Significant ice retreat in the region Patagonia-Antarctic Peninsula observed by ERS SAR.**

Rott, H., Skvarca, P., Rack, W., Stuefer, M., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.2, Noordwijk, European Space Agency, 1997, p.1115-1120, ESA SP-414, 7 refs.

DLC QE33.2.A7 E785 1997 Vol.2

Glacier surveys, Spaceborne photography, Synthetic aperture radar, Glacier flow, Glacier ablation, Ice edge, Seasonal variations, Antarctica—Antarctic Peninsula, Argentina—Patagonia

## 53-3758

**Ocean and ice features detection using the ERS SAR browse images.**

Dokken, S.T., Laur, H., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.3, Noordwijk, European Space Agency, 1997, p.1397-1402, ESA SP-414, 6 refs.

DLC QE33.2.A7 E785 1997 Vol.3

Geophysical surveys, Spaceborne photography, Synthetic aperture radar, Sea ice distribution, Ice detection, Image processing, Resolution, Computer programs, Computer applications

## 53-3759

**Propagation of features in the southern ocean, using ATSR and altimetry.**

Hughes, C.W., Jones, M.S., Carnochan, S., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.3, Noordwijk, European Space Agency, 1997, p.1505-1508, ESA SP-414, 11 refs.

DLC QE33.2.A7 E785 1997 Vol.3

Oceanography, Subpolar regions, Ocean currents, Wave propagation, Spectra, Surface temperature, Spacecraft, Remote sensing, Height finding, Sensor mapping, Pacific Ocean, Drake Passage

## 53-3760

**Polar marine gravity fields from ERS-1.**

Laxon, S.W., McAdoo, D.C., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.3, Noordwijk, European Space Agency, 1997, p.1547-1552, ESA SP-414, 9 refs.

DLC QE33.2.A7 E785 1997 Vol.3

Geophysical surveys, Marine geology, Tectonics, Ocean bottom, Geodetic surveys, Spacecraft, Radar echoes, Gravity, Sensor mapping, Ice cover effect, Data processing, Antarctica, Arctic Ocean

## 53-3761

**ERS scatterometer observations of katabatic winds over a polynya.**

Marshall, G.J., Turner, J., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.3, Noordwijk, European Space Agency, 1997, p.1591-1596, ESA SP-414, 16 refs.

DLC QE33.2.A7 E785 1997 Vol.3

Climatology, Polar atmospheres, Atmospheric circulation, Turbulent boundary layer, Wind velocity, Wind direction, Polynyas, Spaceborne photography, Synthetic aperture radar, Backscattering, Air ice water interaction, Antarctica—Ross Sea

53-3762

Use of ERS scatterometer data to investigate the surface circulation of antarctic mesocyclones.

Turner, J., Marshall, G., ERS Symposium on Space at the Service of Our Environment, 3rd, Florence, Italy, Mar. 14-21, 1997. Proceedings, Vol.3, Noordwijk, European Space Agency, 1997, p.1597-1602, ESA SP-414, 12 refs.

DLC QE33.2.A7 E785 1997 Vol.3

Climatology, Polar atmospheres, Atmospheric circulation, Turbulent boundary layer, Spaceborne photography, Radar echoes, Wind direction, Wind velocity, Models, Antarctica

53-3763

Proceedings.

International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Narita, S., ed, Mombetsu, Hokkaido, Japan, Ship Research Institute, Ministry of Transport, 1999, 335p., Refs. passim. For individual papers see 53-3764 through 53-3788.

Ice solid interface, Sea ice, Offshore structures, Ice loads, Ice cover strength, Ice pressure

53-3764

Overview of ice forces on offshore structures.

Sodhi, D.S., MP 5329, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.7-9, Abstract only.

Offshore structures, Ice solid interface, Ice loads, Ice edge, Ice creep, Sea ice

53-3765

Field survey of pressure ridges in offshore Sakhalin.

Yashima, N., Tabuchi, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.11-20, 1 ref. Includes discussion.

Pressure ridges, Sea ice, Ice cover strength, Compressive properties, Ice floes, Pack ice, Russia—Sakhalin Island, Okhotsk Sea

53-3766

Review of first-year ridge geometries and properties in Sakhalin region.

Frederking, R., Timco, G.W., Kamesaki, K., Tada, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.21-33, 14 refs.

Sea ice, Pressure ridges, Porosity, Compressive properties, Ice temperature, Ice salinity, Ice physics, Russia—Sakhalin Island, Okhotsk Sea, Beaufort Sea

53-3767

Laboratory measurements of ridging and rafting forces.

Tuhkuri, J., Lensu, M., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.34-50, 25 refs. Includes discussion.

Ice rafting, Pressure ridges, Ice mechanics, Ice loads, Ice models, Ice cover strength, Ice floes, Ice deformation, Sea ice

53-3768

LOLEIF Project.

Schwarz, J., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.51-63, 8 refs.

Ice loads, Ice models, Ice forecasting, Ice mechanics, Sea ice, Bothnia, Gulf

53-3769

Study on ice loads acting on marine structures—interim report of JOIA project.

Kato, K., et al, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.64-79, 20 refs.

Ice loads, Ice solid interface, Earthquakes, Offshore structures, Sea ice, Japan—Hokkaido, Russia—Sakhalin Island

53-3770

Design ice forces for offshore structures.

Nevel, D., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.80-87, 4 refs.

Ice loads, Offshore structures, Ice solid interface, Design, Analysis (mathematics), Sea ice

53-3771

Comparison of ice load calculation algorithms for first-year ridges.

Timco, G.W., Frederking, R., Kamesaki, K., Tada, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.88-102, 23 refs.

Pressure ridges, Sea ice, Analysis (mathematics), Ice loads, Ice solid interface, Offshore structures

53-3772

Analysis of the contact between level ice and a structure.

Riska, K., Tuhkuri, J., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.103-120, 42 refs.

Ice solid interface, Ice loads, Sea ice, Ice pressure, Ice models

53-3773

Aseismatic design of offshore structures in frozen seas.

Kobayashi, H., Mito, M., Kawaguchi, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.121-134, 3 refs.

Offshore structures, Design, Sea ice, Ice solid interface, Earthquakes, Design criteria, Ice conditions, Russia—Sakhalin Island

53-3774

Experimental study on dynamic interaction between ice floes and offshore structures caused by seismic motion.

Sato, K., Kagami, T., Nakanishi M., Yashima, N., Adachi, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.135-150, 5 refs.

Ice floes, Ice loads, Ice solid interface, Offshore structures, Sea ice, Ice models, Earthquakes, Beaufort Sea, United States—Alaska—Cook Inlet, China—Bohai Bay

53-3775

Stability of gravity offshore structure based on sand seabed subjected to ice load.

Hyodo, M., Kusakabe, S., Kamesaki, K., Yamauchi, Y., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.151-164, 3 refs.

Ice loads, Offshore structures, Sands, Ocean bottom, Penetration tests, Stress strain diagrams, Sea ice, Beaufort Sea

53-3776

Impact ice load on pile structures.

Hayakawa, T., Kawai, K., Hanada, M., Saeki, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.165-172, 5 refs.

Ice loads, Ice deformation, Ice solid interface, Pile structures, Impact tests, Sea ice, Okhotsk Sea

53-3777

Impact loads on fixed offshore structures.

Astaf'ev, V.N., Polomoshnov, A.M., Surkov, G.A., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.173-178, 3 refs. Includes discussion.

Ice solid interface, Offshore structures, Impact, Ice floes, Sea ice

53-3778

Ice loads from ridges for offshore Sakhalin conditions.

Bekker, A.T., Komarova, O.A., Riazanov, A.V., Ermakov, V.S., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.179-185, 9 refs.

Pressure ridges, Sea ice, Ice loads, Ice solid interface, Offshore structures, Ice models, Russia—Sakhalin Island, Okhotsk Sea

53-3779

Empirical formula for estimating ice loads acting on conical structures.

Ishikawa, S., Kawasaki, T., Yano, S., Kato, K., Kamesaki, K., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.186-203, 7 refs. Includes discussion.

Ice loads, Ice solid interface, Ice models, Mathematical models, Velocity, Sea ice

53-3780

Ice forces on a conical structure interacting with a partially consolidated rubble field.

Izumiyama, K., Takimoto, T., Uto, S., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.204-214, 3 refs.

Ice loads, Ice solid interface, Ice cover thickness, Sea ice, Ice pileup, Offshore structures, Russia—Sakhalin Island

53-3781

Calculation of ice pile-up in front of a large conical structure.

Izumiyama, K., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.215-223, 7 refs.

Ice solid interface, Analysis (mathematics), Ice loads, Sea ice, Ice pileup

53-3782

Probability characteristics of ice loads and actions on offshore structures.

Bekker, A.T., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.224-239, 10 refs.

Sea ice, Ice loads, Ice solid interface, Ice floes, Offshore structures, Mathematical models, Ice models, Velocity, Ice deformation, Okhotsk Sea



## 53-3783

**Behavior of ice sheet strain area and ice failure modes according to indentation velocity in field indentation tests.**

Sakai, M., Narita, K., Matsushita, H., Takeuchi, T., Saeki, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.240-248, 4 refs.

Ice loads, Sea ice, Ice solid interface, Offshore structures, Ice cover thickness, Ice edge, Ice deformation, Japan—Hokkaido

## 53-3784

**Ductile-to-brittle transition speed during ice indentation tests.**

Sodhi, D.S., Takeuchi, T., Nakazawa, N., Akagawa, S., Saeki, H., MP 5330, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.249-263, 27 refs.

Ice cover strength, Ice creep, Ice deformation, Ice pressure, Ice cover thickness, Ice mechanics, Japan—Hokkaido

As part of a five-year program involving laboratory and field tests in Japan, the authors conducted medium-scale indentation tests on sea ice in the harbor of Lake Noto, Hokkaido, by pushing a segmented indenter against the edge of a floating ice sheet. Measurements on each 10-cm wide segment included forces in three directions and the moment about a horizontal line parallel to the indenter face. During the tests in 1998, the authors also installed four tactile sensors on the face of the segmented indenter and measured interfacial pressure during indentation tests at three speeds. They present the results from the load cells and the tactile sensors. They obtained data on the actual contact area and the magnitude of interfacial pressures from the tactile sensors. The authors observed both a "line-like" contact during high-speed (3- and 30-mm/s) indentation tests, and a gradually enlarging contact area attributable to creep deformation of the ice during low-speed (0.3-mm/s) indentation tests. Using the results of a brittle flaking model from the literature, the authors estimate the apparent fracture toughness of the ice from the data on interfacial pressure and the width of the contact area. Taking creep and fracture properties into account, they present a theoretical model to estimate the speed at which the transition from ductile to brittle fracture of ice takes place during ice-structure interaction.

## 53-3785

**Medium-scale field ice indentation test (MSFIT)—results of 1996-1998 winter tests.**

Nakazawa, N., et al, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.264-279, 4 refs.

Sea ice, Ice loads, Ice solid interface, Ice pressure, Ice cover thickness, Ice cover strength, Ice models, Japan—Hokkaido, Okhotsk Sea

## 53-3786

**Strength characteristics of the first-year sea ice at Noto Lagoon.**

Matsushita, H., et al, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.280-292, 3 refs. Includes discussion.

Sea ice, Ice solid interface, Ice cover strength, Offshore structures, Ice mechanics, Compressive properties, Ice loads, Shear strength, Japan—Hokkaido

## 53-3787

**On the comparison of the assumptions of Kry model with MSFIT data.**

Takeuchi, T., et al, International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.293-300, 2 refs.

Sea ice, Ice cover strength, Ice solid interface, Ice pressure, Ice models, Ice cover thickness, Compressive properties, Okhotsk Sea

## 53-3788

**Characteristics for non-simultaneous and simultaneous failures.**

Kamesaki, K., Yamauchi, Y., Tsukuda, H., International Workshop on Rational Evaluation of Ice Forces on Structures, Mombetsu, Japan, Feb. 2-4, 1999. Proceedings, Mombetsu, Japan, Ship Research Institute, Ministry of Transport, 1999, p.301-313, 13 refs. Includes discussion.

Ice loads, Ice solid interface, Ice models, Ice pressure, Velocity

## 53-3789

**Influence of soil structure and stress history on the soil-water characteristics of a compacted till.** Vanapalli, S.K., Fredlund, D.G., Pufahl, D.E., *Geotechnique*, Apr. 1999, 49(2), p.143-159, With French summary. 26 refs.

Clay soils, Glacial till, Soil structure, Soil water migration, Soil pressure, Soil compaction, Soil strength, Soil tests, Engineering geology

## 53-3790

**Undrained shear strength of a glacial clay over-consolidated by desiccation.**

Mesri, G., Ali, S., *Geotechnique*, Apr. 1999, 49(2), p.181-198, With French summary. 74 refs.

Clay soils, Glacial till, Glacial deposits, Outwash, Soil water migration, Soil pressure, Soil strength, Shear strength, Soil tests, Engineering geology, United States—Massachusetts

## 53-3791

**Anomalous water roundup.**

Burton, R.A., *U.S. Office of Naval Research. Branch Office London, England. ONR London report*, July 11, 1969, ONRL-R-33-69, 23p., 33 refs.

Anomalous water, Water structure, Molecular structure

## 53-3792

**Numerical study of freezing and thawing of bulk materials during rail transportation.**

Oosthuizen, P.H., Rush, C.K., Kingston, Ontario, Queen's University, Department of Mechanical Engineering, 1975, 21p. + figs., 6 refs.

Railroad cars, Coal, Frozen cargo, Frost forecasting, Frost protection, Thermal insulation, Artificial thawing, Mathematical models

## 53-3793

**Urban snow removal in Canada.**

Marsters, G.F., Arabackyj, W., Kingston, Ontario, Queen's University, Department of Mechanical Engineering, 1971, 25p. + append., 3 refs.

Snow removal, Urban planning, Streets, Road maintenance, Cost analysis, Canada

## 53-3794

**Phase composition of a partially frozen soil.**

Jame, Y.W., Norum, D.I., Saskatoon, University of Saskatchewan, Department of Agricultural Engineering, [1973], 10p. + figs., 13 refs.

Soil freezing, Frozen ground thermodynamics, Frozen ground temperature, Freezing rate, Soil water, Unfrozen water content, Ice water interface, Phase transformations

## 53-3795

**Boundary layer evaluation of anti-icing fluids for commuter aircraft.**

Louchez, P.R., Laforte, J.L., Bouchard, G., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Dec. 1994, TP 11811E, 35p., MIC-98-07484, With French summary. 10 refs.

Aircraft icing, Chemical ice prevention, Liquid solid interfaces, Air flow, Safety, Cold weather tests, Wind tunnels

## 53-3796

**Examination of the role of fluid freeze point buffers.**

Dawson, P., D'Avirro, J., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Nov. 1997, TP 13129E, 43p. + appends., MIC-99-00564, With French summary.

Aircraft icing, Chemical ice prevention, Ice removal, Antifreezes, Frozen liquids, Freezing points, Safety

## 53-3797

**Aircraft ground de/anti-icing fluid holdover time field testing program for the 1996/97 winter.**

D'Avirro, J., Peters, A., Hanna, M., Dawson, P., Chaput, M., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Oct. 1997, TP 13131E, 233p. + appends., MIC-99-00554, With French summary. 6 refs.

Aircraft icing, Chemical ice prevention, Ice removal, Ice detection, Safety, Cold weather tests, Environmental tests

## 53-3798

**Aircraft ground de/anti-icing fluid holdover time field testing program for the 1995-1996 winter.**

D'Avirro, J., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Nov. 1996, TP 12896E, 170p. + appends., MIC-99-00096, With French summary.

Aircraft icing, Chemical ice prevention, Ice removal, Ice detection, Safety, Cold weather tests, Environmental tests

## 53-3799

**Aircraft ground de/anti-icing fluid holdover time laboratory test program: freezing drizzle and freezing rain.**

Laforte, J.L., Bernardin, S., Dubuisson, C., *Transport Canada. Transportation Development Centre, Montreal. Publication*, May 1997, TP 13036E, 60p. + append., MIC-99-00103, With French summary.

Aircraft icing, Ice accretion, Chemical ice prevention, Ice storms, Cloud chambers, Cold weather tests, Environmental tests, Safety

## 53-3800

**Dynamic physical properties of de/anti-icing fluids.**

Boluk, Y., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Nov. 1997, TP 13133E, 42p., MIC-99-00104, With French summary. 8 refs.

Aircraft icing, Chemical ice prevention, Antifreezes, Liquid solid interfaces, Ice detection, Cold weather tests, Safety

## 53-3801

**Aircraft tire braking friction under winter conditions: laboratory testing.**

Comfort, G., Cowper, B., Gong, S.Y., *Transport Canada. Transportation Development Centre, Montreal. Publication*, June 1996, TP 12584E, Var. p., MIC-98-06208, With French summary. 7 refs.

Runways, Pavements, Road icing, Aircraft icing, Chemical ice prevention, Salting, Sanding, Tires, Rubber ice friction, Skid resistance, Traction, Cold chambers, Cold weather tests, Environmental tests

## 53-3802

**Calibration of the Arctic Marine Transportation Simulation Model.**

Lapp, D.J., Keinonen, A., King, D.H., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Mar. 1997, TP 12989E, Var. p., MIC-99-00017, With French summary. 9 refs.

Icebreakers, Tanker ships, Ice breaking, Ice navigation, Ice routing, Ice solid interface, Metal ice friction, Ice conditions, Ice loads, Computerized simulation

## 53-3803

**Seasonal change in the optical properties of the permanent ice cover on Lake Bonney, Antarctica: consequences for lake productivity and phytoplankton dynamics.**

Fritsen, C.H., Priscu, J.C., *Limnology and oceanography*, Mar. 1999, 44(2), p.447-454, 35 refs.

Frozen lakes, Lake ice, Ice optics, Ice heat flux, Ice cover effect, Algae, Plankton, Plant physiology, Plant ecology, Light effects, Photosynthesis, Biomass, Limnology, Antarctica—Bonney, Lake

53-3804

**4-day wave and transport of UARS tracers in the austral polar vortex.**

Manney, G.L., Orsolini, Y.J., Pumphrey, H.C., Roche, A.E., *Journal of the atmospheric sciences*, Dec. 1, 1998, 55(23), p.3456-3470, 25 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Ozone

53-3805

**Studies of HBr uptake on ice films at 188 K.**

Chu, L.T., Chu, L., *Journal of physical chemistry A*, Jan. 21, 1999, 103(3), p.384-395, 53 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ozone, Ice nuclei, Ice surface, Ice vapor interface, Ice sublimation, Ice composition

53-3806

**Asian summer monsoon instability during the past 60,000 years: magnetic susceptibility and pedogenic evidence from the western Chinese Loess Plateau.**

Fang, X.M., et al, *Earth and planetary science letters*, May 15, 1999, 168(3-4), p.219-232, 50 refs.

Loess, Eolian soils, Quaternary deposits, Soil formation, Soil composition, Remanent magnetism, Stratigraphy, Soil dating, Soil air interface, Atmospheric circulation, Global change, Paleoclimatology, China—Loess Plateau

53-3807

**Cryosphere applications of NSCAT data.**

Long, D.G., Drinkwater, M.R., *IEEE transactions on geoscience and remote sensing*, May 1999, 37(3)pt.II, p.1671-1684, 72 refs.

Sea ice distribution, Ice cover, Mapping, Remote sensing, Ice sheets, Ice shelves, Backscattering, Synthetic aperture radar, Spaceborne photography, Image processing, Greenland, Antarctica

53-3808

**Construction and evaluation of 12.5-km grid NSCAT backscatter maps over Arctic sea ice.**

Ezraty, R., Cavanié, A., *IEEE transactions on geoscience and remote sensing*, May 1999, 37(3)pt.II, p.1685-1697, 11 refs.

Sea ice distribution, Backscattering, Synthetic aperture radar, Spaceborne photography, Ice edge, Image processing, Mapping, Arctic Ocean, Russia—Kara Sea, Russia—Novaya Zemlya

53-3809

**Information fusion for estimation of summer MIZ ice concentration from SAR imagery.**

Haverkamp, D., Tsatsoulis, C., *IEEE transactions on geoscience and remote sensing*, May 1999, 37(3)pt.I, p.1278-1291, 23 refs.

Sea ice distribution, Synthetic aperture radar, Remote sensing, Data processing, Ice floes, Classifications, Backscattering, Accuracy, Image processing, Ice edge, Beaufort Sea, Arctic Ocean

53-3810

**HUT snow emission model and its applicability to snow water equivalent retrieval.**

Pulliainen, J.T., Grandell, J., Hallikainen, M.T., *IEEE transactions on geoscience and remote sensing*, May 1999, 37(3)pt.I, p.1378-1390, 25 refs.

Remote sensing, Radiometry, Microwaves, Snow water equivalent, Mathematical models, Accuracy, Snow density, Brightness, Finland, Switzerland

53-3811

**Information states in radar imagery of sea ice.**

Kerman, B.R., *IEEE transactions on geoscience and remote sensing*, May 1999, 37(3)pt.I, p.1435-1446, 24 refs.

Sea ice, Synthetic aperture radar, Ice structure, Radar photography, Classifications, Analysis (mathematics), Beaufort Sea, Arctic Ocean

53-3812

**Wintertime dynamics of the Terra Nova Bay polynya.**

Van Woert, M.L., *Journal of geophysical research*, Apr. 15, 1999, 104(C4), p.7753-7769, 76 refs.

Sea ice distribution, Ice conditions, Polynyas, Ice heat flux, Air ice water interaction, Wind factors, Mathematical models, Antarctica—Terra Nova Bay, Antarctica—Ross Ice Shelf

53-3813

**Heat budget of snow-covered sea ice at North Pole 4.**

Jordan, R.E., Andreas, E.L., Makshtas, A.P., MP 5331, *Journal of geophysical research*, Apr. 15, 1999, 104(C4), p.7785-7806, Refs. p.7804-7806.

Drift stations, Sea ice, Snow ice interface, Snow air interface, Snow cover effect, Ice heat flux, Snow heat flux, Surface temperature, Snow temperature, Ice temperature, Ice models, Computerized simulation, Mathematical models, North Pole, Arctic Ocean

The Russian drifting station North Pole 4 (NP-4) was within 5° latitude of the North Pole from Apr. 1956 to Apr. 1957. The authors use a wide-ranging set of snow and meteorological data collected at 3-hourly intervals on NP-4 during this period to investigate energy and mass transfer in the snow, sea ice, and atmospheric surface layer in the central Arctic. SNThERM, a one-dimensional energy and mass balance model, synthesizes these diverse NP-4 data and thereby yields energetically consistent time series of the components of the surface heat budget. To parameterize the sensible heat flux during extremely stable stratification, the authors replace the usual log-linear stability function with the "Dutch" formulation and introduce a windless coefficient in the bulk parameterization. This coefficient provides sensible heat transfer at the surface, even when the mean wind speed is near zero, and thereby prevents the surface temperature from falling to unrealistically low values, a common modeling problem when the stratification is very stable. Several other modifications to SNThERM introduce procedures for creating a realistic snowpack that has continuously variable density and is subject to erosion and wind packing. The NP-4 data provide for two distinct simulations: one on 2-year ice and one on multiyear ice. They validate the modeling by comparing simulated and observed temperatures at various depths in the snow and sea ice. Simulations for both sites show the same tendencies. During the summer, the shortwave radiation is the main term in the surface heat budget. Shortwave radiation also penetrates into the snow and causes a subsurface temperature maximum that both the data and the model capture. During the winter, the net longwave balance is the main term in the surface heat budget. The snow and sea ice cool in response to longwave losses, but the flux of sensible heat from the air to the surface mitigates these losses and is thus nearly a mirror image of the emitted longwave flux.

53-3814

**Modification of NO, PO, and NO/PO during flow across the Bering and Chukchi shelves: implications for use as Arctic water mass tracers.**

Cooper, L.W., Cota, G.F., Pomeroy, L.R., Grebmeier, J.M., Whitley, T.E., *Journal of geophysical research*, Apr. 15, 1999, 104(C4), p.7827-7836, 30 refs.

Ocean currents, Water transport, Sea water, Water chemistry, Nutrient cycle, Geochemical cycles, Salinity, Bering Sea, Chukchi Sea, Arctic Ocean

53-3815

**Comparison of laboratory data with a viscous two-layer model of wave propagation in grease ice.**

Newyear, K., Martin, S., *Journal of geophysical research*, Apr. 15, 1999, 104(C4), p.7837-7840, 14 refs.

Frazil ice, Ice water interface, Ice cover effect, Ocean waves, Wave propagation, Viscosity

53-3816

**Siberian-type Quaternary floodplain sedimentation: the example of the Yenisei River.**

Iamskikh, A.F., Iamskikh, A.A., Brown, A.G., Fluvial Processes and Environmental Change. Edited by A.G. Brown and T.A. Quine. British Geomorphological Research Group symposia series, Chichester, UK, John Wiley & Sons, Ltd., 1999, p.241-252, 23 refs.

DLC GB1201.2.F59 1999

Floodplains, Alluvium, Terraces, Quaternary deposits, Soil dating, Geomorphology, Paleoclimatology, Russia—Siberia

53-3817

**Long-term episodic changes in magnitudes and frequencies of floods in the Upper Mississippi River Valley.**

Knox, J.C., Fluvial Processes and Environmental Change. Edited by A.G. Brown and T.A. Quine. British Geomorphological Research Group symposia series, Chichester, UK, John Wiley & Sons, Ltd., 1999, p.255-282, 54 refs.

DLC GB1201.2.F59 1999

Floods, Floodplains, Alluvium, Quaternary deposits, Water erosion, Soil dating, Geomorphology, Paleoclimatology, United States—Mississippi River

53-3818

**Environmental change and sediment yield from glacierised basins: the role of fluvial processes and sediment storage.**

Warburton, J., Fluvial Processes and Environmental Change. Edited by A.G. Brown and T.A. Quine. British Geomorphological Research Group symposia series, Chichester, UK, John Wiley & Sons, Ltd., 1999, p.363-384, 53 refs.

DLC GB1201.2.F59 1999

Glaciation, Glacial erosion, Glacial rivers, Meltwater, Lake bursts, Floods, Sediment transport, Alluvium, Outwash, Floodplains, Geomorphology, Paleoclimatology

53-3819

**Impact of recent climate change on river flow and glaciofluvial suspended sediment loads in South Iceland.**

Lawler, D.M., Wright, L.J., Fluvial Processes and Environmental Change. Edited by A.G. Brown and T.A. Quine. British Geomorphological Research Group symposia series, Chichester, UK, John Wiley & Sons, Ltd., 1999, p.385-407, Refs. p.404-407.

DLC GB1201.2.F59 1999

Glacial erosion, Subglacial drainage, Glacial rivers, Outwash, River flow, Suspended sediments, Alluvium, Sediment transport, Climatic changes, Iceland

53-3820

**Global topography of Mars and implications for surface evolution.**

Smith, D.E., et al, *Science*, May 28, 1999, 284(5419), p.1495-1503, 67 refs.

Mars (planet), Planetary environments, Topographic surveys, Radio echo soundings, Height finding, Spaceborne photography, Geomorphology

53-3821

**Temperatures on Europa from Galileo photopolarimeter-radiometer: nighttime thermal anomalies.**

Spencer, J.R., Tamppari, L.K., Martin, T.Z., Travis, L.D., *Science*, May 28, 1999, 284(5419), p.1514-1516, 34 refs.

Satellites (natural), Extraterrestrial ice, Ice detection, Ice temperature, Ice heat flux, Surface temperature, Albedo, Radiometry, Diurnal variations, Spaceborne photography

53-3822

**Arctic Radiation and Turbulence Interaction Study (ARTIST).**

Hartmann, J., et al, *Berichte zur Polarforschung*, 1999, No.305, 81p., 18 refs.

Sea ice distribution, Ice conditions, Ice cover effect, Ice heat flux, Air ice water interaction, Polar atmospheres, Marine atmospheres, Cloud cover, Atmospheric circulation, Turbulent exchange, Atmospheric boundary layer, Radiation balance, Norway—Svalbard, Arctic Ocean

## 53-3823

**Late Quaternary paleoenvironment along the northern Barents and Kara seas continental margin. A multi parameter analysis. [Spätquartäre Paläoumweltbedingungen am nördlichen Kontinentalrand der Barents- und Kara-See. Eine Multi-Parameter-Analyse]**

Knies, J., *Berichte zur Polarforschung*, 1999, No.304, 159p., In German and English. Refs. p.118-138.

Glaciation, Glacier oscillation, Ice sheets, Glacial meteorology, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Drill core analysis, Stratigraphy, Paleoecology, Global change, Paleoclimatology, Barents Sea, Russia—Kara Sea

## 53-3824

**Polar stratospheric clouds: lidar-observations, characterization of formation and development. [Polare stratosphärische Wolken: Lidar-Beobachtungen, Charakterisierung von Entstehung und Entwicklung]**

Biele, J., *Berichte zur Polarforschung*, 1999, No.303, 194p., In German with English summary. Refs. p.180-194.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ice nuclei, Ozone, Lidar, Norway—Spitsbergen, Greenland

## 53-3825

**Geology of the Bunger Hills-Deman Glacier region, East Antarctica.**

Sheraton, J.W., Tingey, R.J., Oliver, R.L., Black, L.P., *Australian Geological Survey Organisation. AGSO bulletin*, 1995, No.244, 124p. + map, Refs. p.82-87.

DLC QE340.A39 No.244

Geological surveys, Geological maps, Geologic structures, Earth crust, Tectonics, Lithology, Geochemistry, Continental drift, Geochronology, Antarctica—Bunger Hills, Antarctica—Denman Glacier

## 53-3826

**Geosynthetics '99 Conference proceedings.**

Geosynthetics '99, Boston, MA, Apr. 28-30, 1999, Roseville, MN, Industrial Fabrics Association International, 1999, 2 vols.(1,144p. + indexes), Refs. passim. For selected papers see 53-3827 through 53-3833.

Geotextiles, Thaw weakening, Soil trafficability, Soil stabilization, Subgrade soils, Subgrade preparation, Subgrade maintenance

## 53-3827

**Monotonic loading of geogrid-reinforced finite depth granular material.**

Walters, D.L., Raymond, G.P., *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.1, Roseville, MN, Industrial Fabrics Association International, 1999, p.265-278, 8 refs.

Railroad tracks, Cranes (hoists), Footings, Subgrade soils, Thaw weakening, Subgrade preparation, Subgrade maintenance, Geotextiles, Soil stabilization, Bearing tests, Soil trafficability

## 53-3828

**Testing and installation of a geosynthetic clay liner capping system at high elevation—a case study at the Summitville Mine.**

Reimer, D.S., Comer, A.I., Wienecke, C.J., Brewer, W.E., Frobels, R.K., *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.1, Roseville, MN, Industrial Fabrics Association International, 1999, p.307-319.

Mining, Tailings, Leaching, Seepage, Soil pollution, Land reclamation, Geotextiles, Clay soils, Earth fills, Waterproofing, Cold weather operation, Freeze thaw tests, United States—Colorado

## 53-3829

**Geotextiles to stabilize thawing, low-bearing-capacity soils: a comparison of two design methods for use by the US Army.**

Henry, K.S., Holtz, R.D., MP 5332, *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.1, Roseville, MN, Industrial Fabrics Association International, 1999, p.427-440, 16 refs.

Subgrade soils, Ground thawing, Thaw weakening, Bearing tests, Soil trafficability, Aggregates, Geotextiles, Soil stabilization, Subgrade preparation, Subgrade maintenance, Road maintenance

Thawing fine-grained soils are often saturated and have extremely low bearing capacity. Geotextiles reinforce unsurfaced roads on weak, saturated soils and therefore are good candidates for stabilization of thawing soils. To stabilize the soil, a geotextile is placed on it, then the geotextile is covered with aggregate. Design involves selection of aggregate thickness and geotextile. The US Army uses one of two commonly used design techniques for geotextile reinforcement of low-volume roads. The other method, which offers potential to reduce aggregate thickness over the geotextile by accounting for the tensile properties of the geotextile, was compared with the Army method. Although it offers considerable aggregate savings over the current method, it may be unconservative with respect to stresses estimated at the subgrade surface. Future work should consider adopting a method that provides realistic estimates of stresses at the subgrade as well as aggregate savings through accounting for the tensile properties of geotextiles.

## 53-3830

**Repeated loading of reinforced finite depth granular material.**

Walters, D.L., Raymond, G.P., *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.2, Roseville, MN, Industrial Fabrics Association International, 1999, p.697-709, 10 refs.

Railroad tracks, Subgrade soils, Thaw weakening, Settlement (structural), Geotextiles, Soil stabilization, Subgrade preparation, Subgrade maintenance, Soil trafficability

## 53-3831

**Effectiveness of geosynthetics for roadway construction in cold regions: results of a multi-use test section.**

Hayden, S.A., Humphrey, D.N., Christopher, B.R., Henry, K.S., Fettes, C., MP 5333, *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.2, Roseville, MN, Industrial Fabrics Association International, 1999, p.847-862, 6 refs.

Subgrade soils, Soil freezing, Frost resistance, Frost protection, Geotextiles, Composite materials, Soil stabilization, Drainage, Cold weather tests, Subgrade maintenance, Road maintenance, United States—Maine

The Maine Department of Transportation has reconstructed a 3.0 km portion of U.S. Route 1A within the towns of Frankfort and Winterport, ME. This roadway is plagued with poor subgrade soils (A-6) and has been historically known for its poor pavement performance. The reconstruction project is providing an excellent opportunity to evaluate the effectiveness of alternative pavement sections incorporating varying geosynthetics in differing applications under northern climatic conditions. Multiple test sections encompassing the entire length of the project have been constructed using different combinations of geosynthetics including: single and multiple layers of geogrids as reinforcements with and without separation layers; high strength woven geotextile as reinforcement; woven and nonwoven geotextiles as separation/stabilization layers; and, geocomposites to provide horizontal drainage and act as a capillary barrier. A control section with no geosynthetics was also constructed. Each test section is instrumented. Along with an overview of the project, this interim paper presents the reinforcement and drainage data collected during installation and after the first year of monitoring.

## 53-3832

**Initial evaluation of geotextiles for wastewater filtration at temporary base camps.**

Martel, C.J., Pelton, D.K., Henry, K.S., MP 5334, *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.2, Roseville, MN, Industrial Fabrics Association International, 1999, p.1005-1016, 14 refs.

Military facilities, Water treatment, Waste disposal, Sewage disposal, Sanitary engineering, Geotextiles, Filters, Cost analysis, Bosnia

The Army has identified a need for a deployable wastewater treatment system for use at temporary base camps such as those in Bosnia. This study evaluated a new concept for wastewater treatment that features the use of disposable geotextiles for filtration of wastewater. The advantage of this concept is that it eliminates the need for large settling tanks and sludge dewatering operations. Cost estimates indicate that geotextile filtration of wastewater is approximately one-third the cost of conventional treatment. In this bench scale study, up to 70% of the total suspended solids (TSS) and 40%

of the biochemical oxygen demand from raw wastewater (sewage) were removed, demonstrating that nonwoven geotextiles are very good filters. The hydraulic capacity varied from 646 L/m<sup>2</sup> to 3138 L/m<sup>2</sup> depending on the TSS concentration. Approximately one-half of the hydraulic capacity was restored by cleaning. Calculations indicate that the graywater (sewage minus water from latrines) produced by a 550 soldier unit would require 116 m<sup>2</sup> of geotextile per day, which would mean several manual filter changes each day. The alternative is to automate the filter change as it becomes clogged.

## 53-3833

**Unprotected PP liner for storage of paper mill black liquor in cold region.**

Bombardier, L., Jetté, D., Piché, M., Rollin, A., *Geosynthetics '99*, Boston, MA, Apr. 28-30, 1999. Conference proceedings. Vol.2, Roseville, MN, Industrial Fabrics Association International, 1999, p.1083-1095, 10 refs.

Waste disposal, Geotextiles, Synthetic materials, Polymers, Linings, Waterproofing, Cold weather performance

## 53-3834

**Marine evidence for the last glacial advance across eastern Hudson Strait, eastern Canadian Arctic.**

Jennings, A.E., Manley, W.F., MacLean, B., Andrews, J.T., *Journal of Quaternary science*, Nov.-Dec. 1998, 13(6), p.501-514, 48 refs.

Marine geology, Marine deposits, Bottom sediment, Glaciation, Ice sheets, Glacial geology, Glacier oscillation, Glacial deposits, Quaternary deposits, Geochronology, Stratigraphy, Global change, Paleoclimatology, Canada—Hudson Strait, Labrador Sea

## 53-3835

**Replicability and variability of the recent macrofossil and proxy-climate record from raised bogs: field stratigraphy and macrofossil data from Bolton Fell Moss and Walton Moss, Cumbria, England.**

Barber, K., Dumayne-Peaty, L., Hughes, P., Mauquoy, D., Scaife, R., *Journal of Quaternary science*, Nov.-Dec. 1998, 13(6), p.515-528, 50 refs.

Peat, Swamps, Lacustrine deposits, Paleobotany, Plant ecology, Fossils, Palynology, Soil dating, Core samplers, Climatic changes, Paleoclimatology, United Kingdom—England

## 53-3836

**Distinction between the Storegga tsunami and the Holocene marine transgression in coastal basin deposits of western Norway.**

Bondevik, S., Svendsen, J.I., Mangerud, J., *Journal of Quaternary science*, Nov.-Dec. 1998, 13(6), p.529-537, 28 refs.

Marine geology, Shore erosion, Marine deposits, Sea level, Bottom sediment, Lacustrine deposits, Quaternary deposits, Earthquakes, Floods, Soil dating, Geochronology, Stratigraphy, Norway

## 53-3837

**Relic permafrost structures in the Gobi of Mongolia: age and significance.**

Owen, L.A., et al, *Journal of Quaternary science*, Nov.-Dec. 1998, 13(6), p.539-547, 17 refs.

Permafrost distribution, Permafrost indicators, Periglacial processes, Ice wedges, Cryoturbation, Alluvium, Soil dating, Stratigraphy, Paleoclimatology, Mongolia

## 53-3838

**Evidence for Heinrich event 1 in the British Isles.**

McCabe, M., Knight, J., McCarron, S., *Journal of Quaternary science*, Nov.-Dec. 1998, 13(6), p.549-568, 80 refs.

Ice sheets, Glaciation, Glacial geology, Glacier flow, Glacial erosion, Glacial deposits, Moraines, Marine geology, Marine deposits, Ice rafting, Bottom sediment, Sea level, Stratigraphy, Geochronology, Global change, Paleoclimatology, Irish Sea, North Atlantic Ocean

53-3839

**Thermal structure of the arctic summer mesosphere.**

Lübken, F.J., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9135-9149, 24 refs.

Polar atmospheres, Atmospheric composition, Atmospheric physics, Atmospheric density, Aerosols, Ice nuclei, Condensation nuclei, Cloud physics, Clouds (meteorology), Air temperature, Temperature gradients, Thermal regime

53-3840

**Atmospheric moisture transport across the southern ocean via satellite observations.**

Slonaker, R.L., Van Woert, M.L., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9229-9249, 44 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Humidity, Moisture transfer, Precipitation (meteorology), Hydrologic cycle, Ice sheets, Glacial meteorology, Glacier alimentation, Glacier mass balance, Global change, Sea level, Antarctica

53-3841

**Lower stratospheric radiative heating rates and sensitivities calculated from antarctic balloon observations.**

Hicke, J., Tuck, A., Vömel, H., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9293-9308, 35 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Atmospheric pressure, Air temperature, Humidity, Water vapor, Ozone, Cloud cover, Polar stratospheric clouds, Heat flux, Radiation balance, Balloons, Sounding, Antarctica—McMurdo Station

53-3842

**Tropospheric clouds and lower stratospheric heating rates: results from late winter in the Southern Hemisphere.**

Hicke, J., Tuck, A., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9309-9324, 33 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Cloud cover, Polar stratospheric clouds, Sea ice distribution, Ice edge, Ice cover effect, Albedo, Heat flux, Radiation balance, Radiometry, Spaceborne photography, Computerized simulation, Antarctica

53-3843

**Retrieval of aerosol surface area and volume densities from extinction measurements: application to POAM II and SAGE II.**

Steele, H.M., Lumpe, J.D., Turco, R.P., Bevilacqua, R.M., Massie, S.T., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9325-9336, 48 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Ozone, Aerosols, Polar stratospheric clouds, Photochemical reactions, Spaceborne photography, Mathematical models

53-3844

**Role of vegetation and soil in the Holocene megathermal climate over China.**

Wang, H.J., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9361-9367, 31 refs.

Atmospheric circulation, Precipitation (meteorology), Vegetation patterns, Vegetation factors, Plant ecology, Paleobotany, Soil patterns, Soil air interface, Paleoclimatology, Global warming, Computerized simulation, China

53-3845

**Mineral dust aerosol cycle during the last glacial maximum.**

Reader, M.C., Fung, I., McFarlane, N., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9381-9398, 43 refs.

Atmospheric circulation, Aerosols, Dust, Eolian soils, Loess, Soil air interface, Ice cores, Ice dating, Soil dating, Paleoclimatology, Global change, Mathematical models, Computerized simulation, Greenland, Antarctica

53-3846

**Impact of thermomechanical ice sheet coupling on a model of the 100 kyr ice age cycle.**

Tarasov, L., Peltier, W.R., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9517-9545, 63 refs.

Glaciation, Ice sheets, Glacier oscillation, Glacier heat balance, Glacier mass balance, Glacial meteorology, Ice age theory, Global change, Paleoclimatology, Ice models, Mathematical models, Computerized simulation

53-3847

**Growing season energy and CO<sub>2</sub> exchange at a subarctic boreal woodland.**

Lafleur, P.M., *Journal of geophysical research*, Apr. 27, 1999, 104(D8), p.9571-9580, 44 refs.

Forest tundra, Tundra climate, Tundra vegetation, Tundra soils, Plant ecology, Forest ecosystems, Soil air interface, Nutrient cycle, Geochemical cycles, Atmospheric circulation, Atmospheric composition, Carbon dioxide, Canada—Manitoba—Churchill

53-3848

**Freezing effects on water and solute redistribution in unsaturated soils.**

Hofmann, L.L., Fargo, North Dakota State University, 1990, 104p., M.S. thesis. 47 refs.

Soil freezing, Freezing front, Soil water migration, Frozen ground thermodynamics, Frozen ground chemistry

53-3849

**Urban snowmelt processes: modelling and observation.**

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Snow hydrology, Snow heat flux, Snow melting, Snowmelt, Snow removal, Runoff forecasting, Drains, Drainage, Urban planning, Municipal engineering, Sweden

53-3850

**Ice of Lake Erie around South Bass Island 1936-1964.**

Langlois, T.H., Langlois, M.H., Ohio State University, Franz Theodore Stone Laboratory. Contribution, No.14 and Ohio State University. Center for Lake Erie Area Research. Ohio Sea Grant Program. Technical report, No.165, Columbus, Ohio State University, College of Biological Sciences, 1985, 172p., Refs. p.117-123. Posthumous publication edited by J.L. Forsyth.

Lake ice, Ice conditions, Ice formation, Freezeup, Ice melting, Ice breakup, Erie, Lake

53-3851

**Lichens: lichenometric dating of diachronous surfaces.**

McCarroll, D., *Earth surface processes and landforms*, Winter 1995, 20(9), Technical and software bulletin, 1995, No.4, p.829-831, 4 refs. Description of software to accompany earlier paper by D. McCarroll, for which see 48-3009.

Avalanches, Avalanche deposits, Lichens, Soil dating, Age determination, Computer programs, Norway

53-3852

**Variability of Fram Strait ice flux and North Atlantic Oscillation.**

Kwok, R., Rothrock, D.A., *Journal of geophysical research*, Mar. 15, 1999, 104(C3), p.5177-5189, 18 refs.

Sea ice distribution, Ice volume, Drift, Air ice water interaction, Atmospheric circulation, Atmospheric pressure, Ocean currents, Salinity, Statistical analysis, Fram Strait

53-3853

**Mass, heat, and salt transport in the southeastern Pacific: a Circumpolar Current inverse model.**

Gille, S.T., *Journal of geophysical research*, Mar. 15, 1999, 104(C3), p.5191-5209, 45 refs.

Atmospheric circulation, Air water interactions, Ocean currents, Sea water, Water transport, Water temperature, Salinity, Heat flux, Heat balance, Computerized simulation

53-3854

**Influence of melting icebergs on distribution, characteristics and transport of marine particles in an East Greenland fjord.**

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Glacial geology, Marine geology, Glacial till, Glacial deposits, Sediment transport, Calving, Icebergs, Ice rafting, Ice melting, Meltwater, Suspended sediments, Marine deposits, Bottom sediment, Greenland

53-3855

**Sea-ice impact on long-term particle flux in the Greenland Sea's Is Odden-Nordbukta region, 1985-1996.**

Ramseier, R.O., Garrity, C., Bauerfeind, E., Peinert, R., *Journal of geophysical research*, Mar. 15, 1999, 104(C3), p.5329-5343, 53 refs.

Sea ice distribution, Ice conditions, Ice edge, Ice cover effect, Marine biology, Nutrient cycle, Geochemical cycles, Suspended sediments, Marine deposits, Bottom sediment, Greenland Sea

53-3856

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Marine biology, Plankton, Algae, Biomass, Nutrient cycle, Suspended sediments, Antarctica—Ross Sea

53-3857

**Physical and chemical characteristics of aerosols at Spitsbergen in the spring of 1996.**

Staebler, R.M., et al, *Journal of geophysical research*, Mar. 20, 1999, 104(D5), p.5515-5529, 30 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Aerosols, Air pollution, Ozone, Norway—Spitsbergen

53-3858

**Three-dimensional representations of hexagonal ice crystals and hail particles of elliptical cross sections.**

Wang, P.K., *Journal of the atmospheric sciences*, Apr. 15, 1999, 56(8), p.1089-1093, 6 refs.

Ice crystal structure, Hailstone structure, Mathematical models

53-3859

**Turbulence structure in an ice-covered, sand-bed river.**

Sukhodolov, A., Thiele, M., Bungartz, H., Engelhardt, C., *Water resources research*, Mar. 1999, 35(3), p.889-894, 12 refs.

Icebound rivers, River ice, Ice cover effect, Ice water interface, River flow, Turbulence, Mathematical models

53-3860

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Blake, E.W., Clarke, G.K.C., *Journal of geophysical research*, Apr. 10, 1999, 104(B4), p.7481-7495, 58 refs.

Glacial hydrology, Subglacial drainage, Glacier beds, Subglacial observations, Electromagnetic prospecting, Electrical logging, Bottom topography, Water pressure, Water flow, Flow rate, Canada—Yukon Territory

53-3861

**Characterization of the basal hydraulic system of a surge-type glacier: Trapridge Glacier, 1989-1992.**

Stone, D.B., Vancouver, University of British Columbia, 1993, 210p., University Microfilms order No.80866, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Feb 1994, 54(8), p.4050.

Glacial hydrology, Subglacial drainage, Glacier flow, Glacier friction, Glacier heat balance, Glacier surges, Glacier beds, Basal sliding, Meltwater, Water pressure, Water flow

53-3862

**Oxygen isotopic studies of ice, snow and water samples near the Indian stations in Antarctica.**

Bhattacharya, S.K., Nijampurkar, V.N., *Geological Society of India. Journal*, Mar. 1998, 51(3), p.399-404, 13 refs.

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53-3863

**Snow survey bulletin & water supply forecast, March 1, 1999, Yukon Territory.**

Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1999, 27p.

Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

53-3864

**Snow survey bulletin & water supply forecast, April 1, 1999, Yukon Territory.**

Canada. Indian and Northern Affairs. Water Resources Division, Whitehorse, 1999, 27p.

Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

53-3865

**Assessment of LTPP friction data.**

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Pavements, Skid resistance, Tires, Traction, Road icing, Salting, Sanding, Rubber ice friction, Cold weather performance, Road maintenance

53-3866

**Surface and 700 hPa atmospheric circulation patterns for the Great Lakes basin and eastern North America and relationship to atmospheric teleconnections.**

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Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Air water interactions, Synoptic meteorology, Long range forecasting, Global warming, Statistical analysis, Great Lakes

53-3867

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Lake water, Water pollution, Water chemistry, Suspended sediments, Chemical analysis, Statistical analysis, Great Lakes

53-3868

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Pavements, Subgrade soils, Soil strength, Soil trafficability, Bearing strength, Impact tests, Strain tests, Test equipment, Road maintenance

53-3869

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Grönvall, H., et al, *Finnish Institute of Marine Research (Merentutkimuslaitos). Report series. Meri (the sea)*, 1998, No.33, Integrated Use of New Microwave Satellite Data for Improved Sea Ice Observations. IMSI report, No.2, p.3-47, 7 refs. Ice surveys, Sea ice distribution, Ice conditions, Ice sampling, Weather stations, Meteorological data, Radiometry, Synthetic aperture radar, Spaceborne photography, Bothnia, Gulf

53-3870

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Ice surveys, Sea ice distribution, Ice conditions, Drift, Ice reporting, Ice forecasting, Synthetic aperture radar, Spaceborne photography, Data transmission, Computer programs, Baltic Sea

53-3871

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53-3872

**Blade heating system of arctic wind turbine; design, development and implementation. [Arktisen tuulivoimalaitoksen lapalämmitysjärjestelmän suunnittelu, kehitys ja toteutus]**

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Wind power generation, Propellers, Ice accretion, Ice loads, Electric heating, Defrosting, Artificial melting, Ice prevention, Ice removal, Computerized simulation

53-3873

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Antikainen, P., *Finland. Technical Research Centre. VTT research notes (Valtion teknillinen tutkimuskeskus. VTT tiedotteita)*, 1998, No.1909, 39p., In Finnish with English summary. 7 refs.

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53-3874

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Research projects, International cooperation, Regional planning, Polar atmospheres, Marine atmospheres, Marine biology, Air ice water interaction, Environmental protection, Global warming, Paleoclimatology

53-3875

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Oil spills, Water pollution, Ice cover effect, Weathering, Environmental impact, Computerized simulation

53-3876

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Research projects, Organizations, Regional planning, Exploration, Economic development, Environmental impact, Cost analysis, Canada

53-3877

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Streams, Ponds, River ice, Ice formation, Ice cover thickness, Ice cover effect, Animals, Ecology, Ecosystems, United States—California—Sierra Nevada

53-3878

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River ice, Ice formation, Ice conditions, Bottom ice, Ice cover effect, Ecology, Ecosystems, United States—Montana

53-3879

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River ice, Lake ice, Ice conditions, Ice cover effect, Ecology, Ecosystems, Animals, Environmental protection, Cold weather operation

53-3880

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Plant tissues, Vegetation factors, Ice formation, Ice accretion, Ice structure, Capillarity

53-3881

**Heat balance and unfrozen water content during the removal of snow cover at Oberurgel, 1980 meters above sea level. [Wärmehaushalt und freier Wassergehalt beim Abbau der Schneedecke (Oberurgel, 1980 m Seehöhe)]**

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Glacial hydrology, Glacier heat balance, Snow ice interface, Snow water content, Snow melting, Snowmelt, Austria

53-3882

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Mountain glaciers, Glacier alimentation, Firm stratification, Glacier ice, Ice sampling, Ice composition, Fallout, Ice dating, Austria

53-3883

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Glacier surveys, Ice sheets, Expeditions, Greenland

53-3884

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Research projects, Organizations, Education, Regional planning, Finland

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Snow hydrology, Snow heat flux, Snow melting, Snowmelt, Urban planning, Municipal engineering, Mathematical models, Sweden

53-3886

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Tundra climate, Tundra vegetation, Vegetation patterns, Plant physiology, Evapotranspiration, Soil air interface, Atmospheric circulation, Heat flux, Heat balance, Water balance, Hydrologic cycle, Geochemical cycles, Nutrient cycle, Global warming, United States—Alaska—North Slope

53-3887

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Steppes, Deserts, Meadow soils, Desert soils, Vegetation patterns, Soil erosion, Desiccation, Heat flux, Heat balance, Water balance, Hydrologic cycle, Climatic changes, Computerized simulation, China

53-3888

Regularities of natural cycles, predictions of climate and surface conditions.

Berry, B.L., *Hydrological processes*, Oct.-Nov. 1998, 12(13-14), BAHC-LUCC Joint Inter-Core Project Symposium on Interactions between the Hydrological Cycle and Land Use/Cover, Kyoto, Japan, Nov. 4-7, 1996, p.2267-2278, 21 refs.

Ice age theory, Glaciation, Global change, Paleoclimatology, Geochronology, Mathematical models, Computerized simulation

53-3889

Regional hydrological effects of grassland degradation in the Loess Plateau of China.

Wang, Q.X., Takahashi, H., *Hydrological processes*, Oct.-Nov. 1998, 12(13-14), BAHC-LUCC Joint Inter-Core Project Symposium on Interactions between the Hydrological Cycle and Land Use/Cover, Kyoto, Japan, Nov. 4-7, 1996, p.2279-2288, 19 refs.

Loess, Eolian soils, Steppes, Meadow soils, Soil erosion, Vegetation patterns, Evapotranspiration, Heat balance, Water balance, Hydrologic cycle, Desiccation, Climatic changes, Mathematical models, China—Loess Plateau

53-3890

Fish ecology in arctic North America.

American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992, Reynolds, J.B., ed, Bethesda, MD, American Fisheries Society, 1997, 345p., Refs. passim. For selected papers see 53-3890 through 53-3898.

DLC QL637.F54 1992

Marine biology, Animals, Ecology, Ecosystems, Ice cover effect, Physiological effects, Cold tolerance, Cold weather survival

53-3891

Canadian perspective on issues in arctic fisheries management and research.

Reist, J.D., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.4-12, 3 refs.

DLC QL637.F54 1992

Ecology, Marine biology, Ecosystems, Environmental protection, Animals, Natural resources, Economic development, Regional planning, Canada

53-3892

Review of fish ecology in arctic North America.

Power, G., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.13-39, Refs. p.33-39.

DLC QL637.F54 1992

Animals, Marine biology, Ecology, Ecosystems, Cryobiology, Limnology, Ice cover effect, Light effects, Physiological effects, Acclimatization, Antifreezes, Cold tolerance, Cold weather survival

53-3893

Review of the physical oceanography of the north-eastern Chukchi Sea.

Weingartner, T.J., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.40-59, 45 refs.

DLC QL637.F54 1992

Ocean currents, Water transport, Water temperature, Salinity, Wind factors, Bottom topography, Sea ice distribution, Ice edge, Ecology, Marine biology, Chukchi Sea

53-3894

Effects of low temperatures and starvation on resistance to stress in presmolt coho salmon.

Moles, A., Korn, S., Rice, S., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.148-154, 32 refs.

DLC QL637.F54 1992

Animals, Marine biology, Ecology, Physiological effects, Cold tolerance, Cold weather survival

53-3895

Population dynamics of broad whitefish in the Prudhoe Bay region, Alaska.

Gallaway, B.J., Feckhelm, R.G., Griffiths, W.B., Cole, J.G., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.194-207, 31 refs.

DLC QL637.F54 1992

Offshore drilling, Offshore structures, Artificial islands, Embankments, Earth fills, Environmental impact, Deltas, Marine biology, Animals, Ecosystems, Ecology, United States—Alaska—Prudhoe Bay

53-3896

Experimental introduction of arctic grayling to a rehabilitated gravel extraction site, North Slope, Alaska.

Hemming, C.R., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.208-213, 9 refs.

DLC QL637.F54 1992

Mining, Pits (excavations), Tundra, Streams, Land reclamation, Ice cover effect, Animals, Ecology, Ecosystems, Cold weather survival, United States—Alaska—North Slope

53-3897

Use of a stress index to estimate temperature and salinity stress in arctic ciscoes.

Bryan, J.D., Feckhelm, R.G., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.262-273, 41 refs.

DLC QL637.F54 1992

Marine biology, Animals, Ecosystems, Ecology, Salinity, Physiological effects, Cold tolerance, Cold weather survival

53-3898

Synthesis in applied fish ecology: twenty years of studies on effects of causeway development on fish populations in the Prudhoe Bay region, Alaska.

Wilson, W.J., Gallaway, B.J., American Fisheries Society Symposium, 19th, Fairbanks, AK, May 19-21, 1992. Fish ecology in arctic North America. Edited by J.B. Reynolds, Bethesda, MD, American Fisheries Society, 1997, p.326-339, 25 refs.

DLC QL637.F54 1992

Offshore drilling, Offshore structures, Artificial islands, Embankments, Earth fills, Environmental impact, Deltas, Marine biology, Animals, Ecosystems, Ecology, United States—Alaska—Prudhoe Bay

53-3899

Structure of ice multilayers on metals.

Witek, H., Buch, V., *Journal of chemical physics*, Feb. 8, 1999, 110(6), p.3168-3175, 26 refs.

Ice models, Ice structure, Ice surface, Ice dielectrics, Ice relaxation, Polarization (charge separation)

53-3900

Isotopic composition of diatom-bound nitrogen in southern ocean sediments.

Sigman, D.M., Altabet, M.A., Francois, R., McCorkle, D.C., Gaillard, J.F., *Paleoceanography*, Apr. 1999, 14(2), p.118-134, 70 refs.

Marine deposits, Bottom sediment, Marine biology, Biomass, Nutrient cycle, Algae, Plankton, Fossils, Isotope analysis, Paleocology, Air water interactions, Atmospheric circulation, Atmospheric composition, Paleoclimatology, Global change, Antarctica

53-3901

Late Quaternary variations in sea surface temperatures and their relationship to orbital forcing recorded in the southern ocean (Atlantic sector).

Brathauer, U., Abelman, A., *Paleoceanography*, Apr. 1999, 14(2), p.135-148, 74 refs.

Glaciation, Air ice water interaction, Atmospheric circulation, Ocean currents, Water transport, Water temperature, Surface temperature, Ice age theory, Global change, Paleoclimatology, Antarctica



53-3902

**Similar glacial and Holocene deep water circulation inferred from southeast Pacific foraminiferal carbon isotope composition.**  
Matsumoto, K., Lynch-Stieglitz, J., *Paleoceanography*, Apr. 1999, 14(2), p.149-163, 90 refs.  
Marine deposits, Bottom sediment, Glaciation, Paleocology, Carbon isotopes, Isotope analysis, Ocean currents, Water transport, Global change, Paleoclimatology, Pacific Ocean

53-3903

**Surface and deep ocean variability in the northern Sargasso Sea during marine isotope stage 3.**  
Keigwin, L.D., Boyle, E.A., *Paleoceanography*, Apr. 1999, 14(2), p.164-170, 42 refs.  
Marine deposits, Bottom sediment, Drill core analysis, Isotope analysis, Glaciation, Air water interactions, Atmospheric circulation, Ocean currents, Water transport, Water temperature, Salinity, Surface temperature, Global change, Paleoclimatology, North Atlantic Ocean

53-3904

**Diffuse spectral reflectance as a proxy for percent carbonate content in North Atlantic sediments.**  
Ortiz, J., Mix, A., Harris, S., O'Connell, S., *Paleoceanography*, Apr. 1999, 14(2), p.171-186, 59 refs.  
Glaciation, Marine deposits, Bottom sediment, Drill core analysis, Ice age theory, Global change, Atmospheric circulation, Ocean currents, Air water interactions, Paleoclimatology, North Atlantic Ocean

53-3905

**U and Th isotope constraints on the duration of Heinrich events H0-H4 in the southeastern Labrador Sea.**  
Veiga-Pires, C.C., Hillaire-Marcel, C., *Paleoceanography*, Apr. 1999, 14(2), p.187-199, 60 refs.  
Glaciation, Glacial deposits, Ice rafting, Marine deposits, Bottom sediment, Ice age theory, Global change, Paleoclimatology, Labrador Sea

53-3906

**Role of oceanic forcing in mid-Holocene Northern Hemisphere climatic change.**  
Kerwin, M.W., Overpeck, J.T., Webb, R.S., DeVernal, A., Rind, D.H., Healy, R.J., *Paleoceanography*, Apr. 1999, 14(2), p.200-210, 77 refs.  
Air ice water interaction, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Ocean currents, Paleobotany, Forest lines, Water temperature, Surface temperature, Global change, Paleoclimatology, Computerized simulation, North Atlantic Ocean, Arctic Ocean

53-3907

**Mid-Wisconsin Laurentide Ice Sheet growth and decay: Implications for Heinrich events 3 and 4.**  
Kirby, M.E., Andrews, J.T., *Paleoceanography*, Apr. 1999, 14(2), p.211-223, 82 refs.  
Glaciation, Ice sheets, Glacier oscillation, Glacial deposits, Ice rafting, Marine deposits, Bottom sediment, Global change, Paleoclimatology, Labrador Sea

53-3908

**High-resolution  $U^{37}$  temperature reconstructions in the South China Sea over the past 220 kyr.**  
Pelejero, C., Grimalt, J.O., Heilig, S., Kienast, M., Wang, L.J., *Paleoceanography*, Apr. 1999, 14(2), p.224-231, 45 refs.  
Marine deposits, Bottom sediment, Drill core analysis, Atmospheric circulation, Ocean currents, Water temperature, Surface temperature, Isotope analysis, Global change, Paleoclimatology, South China Sea

53-3909

**36 kyr geochemical record from the Sea of Japan of organic matter flux variations and changes in intermediate water oxygen concentrations.**  
Crusius, J., Pedersen, T.F., Calvert, S.E., Cowie, G.L., Oba, T., *Paleoceanography*, Apr. 1999, 14(2), p.248-259, 50 refs.  
Marine deposits, Bottom sediment, Sea water, Water chemistry, Salinity, Oxygen, Aeration, Nutrient cycle, Geochemical cycles, Ocean currents, Global change, Paleoclimatology, Japan, Sea

53-3910

**Protection of living space from floods, mudflows and avalanches. Proceedings. [Internationales Symposium. Schutz des Lebensraumes vor Hochwasser, Muren und Lawinen. Tagungspublikation]**  
International Congress Interpraevent 1996, Garmisch-Partenkirchen, Germany, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, 5 vols., In German, English or French with summaries in German or English. Refs. passim. For individual papers see 51-251 through 51-254 and 53-3911 through 53-3942.

DLC QC981.8.C5165 1996

Avalanche modeling, Avalanche mechanics, Avalanche tracks, Avalanche forecasting, Avalanche engineering, Mudflows, Slope protection, Soil conservation, Global warming, Flood forecasting

53-3911

**History of torrent and avalanche control in Bavaria. [Hundert Jahre Wildbachverbauung in Bayern—Bilanz und Ausblick]**  
Göttle, A., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.1-26, In German with English summary. 15 refs.

DLC QC981.8.C5165 1996 Vol.1

Flood control, Channel stabilization, Hydraulic structures, Soil erosion, Soil conservation, Soil stabilization, Slope protection, Avalanche engineering, History, Germany

53-3912

**New development of torrent control in Japan.**  
Kobashi, S., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.27-37, With German summary. 6 refs.

DLC QC981.8.C5165 1996 Vol.1

Earthquakes, Volcanoes, Landslides, Mudflows, Accidents, Soil erosion, Soil conservation, Soil stabilization, Slope protection, Flood control, Japan

53-3913

**Does the alpine climate change during the next decades.**  
Schaller, E., Keuler, K., Knoche, R., Münzenberg-St. Denis, A., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.43-53, With German summary. 8 refs.

DLC QC981.8.C5165 1996 Vol.1

Global warming, Climatic changes, Atmospheric circulation, Air temperature, Precipitation (meteorology), Computerized simulation, Statistical analysis, Alps

53-3914

**Mesoscale Alpine Programme (MAP): an international research initiative in Alpine meteorology.**  
Volkert, H., et al., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.55-63, With German summary. 7 refs.

DLC QC981.8.C5165 1996 Vol.1

Precipitation (meteorology), Weather forecasting, Flood forecasting, Meteorological data, Data processing, Computerized simulation, Alps

53-3915

**Glacial discharge as affected by climate change.**  
Braun, L.N., Escher-Vetter, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.65-74, With German summary. 15 refs.

DLC QC981.8.C5165 1996 Vol.1

Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial hydrology, Meltwater, Runoff forecasting, Flood forecasting, Global warming, Climatic changes, Switzerland, Austria

53-3916

**Regional downscaling—a powerful tool for climate impact research. [Regional Downscaling—Werkzeug der Klimawirkungsforschung]**  
Rickli, R., Salvisberg, E., Wanner, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.75-82, In German with English summary. 7 refs.

DLC QC981.8.C5165 1996 Vol.1

Atmospheric circulation, Global warming, Computerized simulation, Flood forecasting

53-3917

**Does the recent development of the climate allow a verification of anthropogenic influences. [Gestartet die rezente Klimaentwicklung eine Verifizierung anthropogener Einflüsse]**  
Schwarzl, S., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.83-95, In German with English summary. 13 refs.

DLC QC981.8.C5165 1996 Vol.1

Atmospheric circulation, Atmospheric composition, Air pollution, Global warming, Human factors, Computerized simulation

53-3918

**Influence of forests on floods from small pre-alpine catchments. [Einfluss des Waldes auf Hochwasser aus kleinen voralpinen Einzugsgebieten]**  
Burch, H., Forster, F., Schleppl, P., Stadler, D., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.159-169, In German with English summary. 7 refs.

DLC QC981.8.C5165 1996 Vol.1

Forest land, Forest canopy, Vegetation factors, Precipitation (meteorology), Interception, Evapotranspiration, Water retention, Water balance, Snowmelt, Runoff forecasting, Flood forecasting, Switzerland

53-3919

**Mapping of the protective functions of the mountain's forest.**  
Berger, F., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany, Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.171-180, With French summary. 17 refs.

DLC QC981.8.C5165 1996 Vol.1

Forest strips, Forest land, Revegetation, Protective vegetation, Snow hedges, Slope protection, Avalanche forecasting, Avalanche engineering, Mapping, Computer applications, France

53-3920

Investigations of debris flow activity in the Mattertal, Valais, Switzerland. [Untersuchungen zur Murgangaktivität im Mattertal, Wallis, Schweiz] Dikau, R., Gärtner, H., Holl, B., Kienholz, H., Mani, P., Zimmermann, M., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.397-408, In German with English summary. 8 refs.  
DLC QC981.8.C5I65 1996 Vol.1

Snowmelt, Permafrost indicators, Solifluction, Mudflows, Floods, Flood forecasting, Switzerland

53-3921

Spatial-temporal variations of the permafrost distribution in the Sulden Valley (Ortler Mountains) and its effects on the hazard potential of erosional processes. [Auswirkungen des zeitlich-räumlichen Wandels der Permafrostverteilung im Suldenal (Ortlergebiet) auf das Gefährdungspotential durch Erosionsprozesse] Stötter, J., Maukisch, M., Simstich, J., Belitz, K., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.1, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.447-457, In German with English summary. 29 refs.

DLC QC981.8.C5I65 1996 Vol.1

Discontinuous permafrost, Permafrost distribution, Ground thawing, Periglacial processes, Rock glaciers, Mudflows, Mass movements (geology), Global warming, Climatic changes, Italy—Ortles Mountains

53-3922

Review of avalanche run-out calculation models and evaluation for the application in hazard-zone mapping. [Übersicht über die Lawinenberechnungsmodelle und Bewertung hinsichtlich des Einsatzes in der Gefahrenzonenplanung]

Kleemayr, K., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.3-18, In German with English summary. 44 refs.  
DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Avalanche tracks, Avalanche forecasting, Computerized simulation

53-3923

Gasdynamic avalanche simulation model. [Ein gasdynamisches Lawinensimulationsmodell] Brandstätter, W., Hagen, G., Hufnagl, H., Schaffhauser, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.19-30, In German with English summary. 9 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Avalanche forecasting, Computerized simulation

53-3924

Avalanche simulation based on gasdynamics. [Ein gasdynamisches Lawinensimulationsmodell—Modellentwicklung auf Grundlage der Simulationssoftware FIRE der AVL]

Brandstätter, W., Sampl, P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.31-51, In German with English summary. 10 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Avalanche forecasting, Turbulent flow, Computerized simulation

53-3925

Gasdynamic avalanche simulation model—actual operation and further development. [Ein gasdynamisches Lawinensimulationsmodell—derzeitige Handhabung und Weiterentwicklung] Schaffhauser, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.53-65, In German with English summary. 7 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Avalanche tracks, Avalanche forecasting, Turbulent flow, Computerized simulation, Austria

53-3926

Gasdynamic avalanche simulation model—verification of this avalanche simulation model by comparison with the catastrophic avalanches of the year 1984. [Ein gasdynamisches Lawinensimulationsmodell—Verifizierung des Lawinensimulationsmodells anhand von Katastrophenlawinen des Lawinenwinters 1984]

Hufnagl, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.67-79, In German with English summary. 6 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanches, Avalanche modeling, Avalanche mechanics, Avalanche forecasting, Computerized simulation, Austria

53-3927

Estimation of avalanche hazard of mountain territories.

Severskiĭ, I.V., Blagoveshchenskii, V.P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.91-101, With German summary. 10 refs.

DLC QC981.8.C5I65 1996 Vol.2

Snow cover stability, Avalanche formation, Avalanche tracks, Avalanche forecasting, Statistical analysis, Kazakhstan

53-3928

Approach to documentation and evaluation of structural patterns in mountain forests as a basis for understanding avalanche formation. [Konzept zur Erfassung und Bewertung von Strukturen im Bergwaldbereich als Grundlage für das Verständnis der Lawinengesehe]

Maukisch, M., et al, Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.103-112, In German with English summary. 6 refs.

DLC QC981.8.C5I65 1996 Vol.2

Forest land, Terrain identification, Avalanche formation, Avalanche forecasting, Data processing, Computerized simulation

53-3929

GIS-based analysis of the relationship between forest avalanches and topography. [GIS-Analyse des Zusammenhanges zwischen Waldlawinen und Topographie]

Strempel, K., et al, Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.113-124, In German with English summary. 11 refs.

DLC QC981.8.C5I65 1996 Vol.2

Forest land, Terrain identification, Avalanche formation, Avalanche modeling, Avalanche forecasting, Data processing, Computerized simulation

53-3930

Method for avalanche load determination.

Epifanov, V.P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.125-136, With German summary. 11 refs. in Russian.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Snow loads, Impact tests

53-3931

Calculation of snow avalanche parameters.

Blagoveshchenskii, V.P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.137-146, With German summary. 14 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Avalanche tracks, Avalanche forecasting, Mathematical models, Statistical analysis

53-3932

Similarity of avalanche experiments by light particles.

Nohguchi, Y., et al, Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.147-156, 5 refs.

DLC QC981.8.C5I65 1996 Vol.2

Avalanche modeling, Avalanche mechanics, Environmental tests

53-3933

Stake of avalanche trials. [L'enjeu des procès d'avalanches]

Lambert, R., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.157-166, In French with English summary. 1 ref.

DLC QC981.8.C5I65 1996 Vol.2

Avalanches, Avalanche forecasting, Accidents, Safety, Legislation, France

53-3934

Present morphological development of the slopes intensively exploited by skiers: case study of the northern Pilsko slope, Polish western Carpathians.

Lajczak, A., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.2, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.191-202, With German summary. 15 refs.

DLC QC981.8.C5I65 1996 Vol.2

Snow cover distribution, Snow stabilization, Skis, Human factors, Grazing, Slope processes, Soil erosion, Slope protection, Soil conservation, Regional planning, Poland

53-3935

Avalanche hazard risk mapping in Russia.

Losev, K.S., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.3, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.29-36, With German summary. 5 refs. in Russian.

DLC QC981.8.C5I65 1996 Vol.3

Avalanche tracks, Avalanche deposits, Avalanche forecasting, Mapping, Regional planning, Russia

## 53-3936

**Hazard Index maps for snow avalanches—application of computer-based simulation models.** [Gefahrenhinweiskarte für Lawinen—Einsatz von EDV-gestützten Simulationsmodellen]

Hegg, C., Buri, H., Ryter, U., Kienholz, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.3, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.37-46, In German with English summary. 5 refs.

DLC QC981.8.C5165 1996 Vol.3

Avalanche modeling, Avalanche forecasting, Slope processes, Slope stability, Mapping, Computerized simulation, Switzerland

## 53-3937

**Hazard maps: decisive parameters and criteria for definition of intensity degree.** [Gefahrenkarten: Massgebliche Parameter und Kriterien zur Festlegung von Intensitätsstufen]

Kienholz, H., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.3, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.47-58, In German with English summary. 6 refs.

DLC QC981.8.C5165 1996 Vol.3

Avalanche forecasting, Flood forecasting, Mapping, Regional planning, Switzerland

## 53-3938

**Reconstitution rain-on-snow events in the western Swiss Prealps, 1740-1918.** [Reconstitution d'événements de pluie sur neige dans la vallée des Ormonts (Préalpes vaudoises, Suisse) 1740-1918]

Schoeneich, P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.4, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.165-174, In French with English summary. 5 refs.

DLC QC981.8.C5165 1996 Vol.4

Rain, Snow hydrology, Snowmelt, Floods, Accidents, History, Flood forecasting, Switzerland

## 53-3939

**Protective structure project in environmentally sensitive areas: Turtmann Valley in the Wallis Canton, Switzerland, as an example.** [Verbaunungsprojekte in landschaftlich empfindlichen Gebieten, dargestellt an Beispielen des Turtmanns (Kt. Wallis, Schweiz)]

Wyer, M., Brigger, A., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.4, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.187-197, In German with English summary. 2 refs.

DLC QC981.8.C5165 1996 Vol.4

Avalanche engineering, Snow fences, Snow stabilization, Earthwork, Slope protection, Switzerland

## 53-3940

**Traditional strategies against avalanches.** [Stratégies traditionnelles face au danger d'avalanches]

Busset, M.C., Schoeneich, P., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.4, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.255-264, In French with English summary. 5 refs.

DLC QC981.8.C5165 1996 Vol.4

Avalanches, Avalanche engineering, Safety, History, Switzerland

## 53-3941

**Alpine seed mixtures for recultivation in high mountain areas.** [Einsatz standortgerechter Alpin-Saatgutmischungen für Begrünungen im Gebirge]

Krautzer, B., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.5, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.145-154, In German with English summary. 10 refs.

DLC QC981.8.C5165 1996 Vol.5

Mountain soils, Soil conservation, Land reclamation, Grasses, Introduced plants, Revegetation, Protective vegetation, Plant ecology, Austria

## 53-3942

**Road corridor stabilization in the Himalayas.**

Kern, J., Krähenbühl, J., Internationales Symposium (International Congress) Interpraevent 1996, Garmisch-Partenkirchen, Germany. Tagungspublikation. Vol.5, Klagenfurt, Austria, Internationale Forschungsgesellschaft, Interpraevent, 1996, p.197-206, With German summary. 3 refs.

DLC QC981.8.C5165 1996 Vol.5

Highway planning, Road maintenance, Protective vegetation, Soil conservation, Soil stabilization, Slope protection, Landslide control, Channel stabilization, Flood control, Nepal, Bhutan

## 53-3943

**Geologic studies in Alaska by the U.S. Geological Survey, 1996.**

Gray, J.E., ed, Riehle, J.R., ed, *U.S. Geological Survey. Professional paper*, 1998, No.1595, 200p., Refs. passim. For selected papers see 53-3944 through 53-3951.

Geological surveys, Exploration, Geochemistry, Minerals, Gold, Natural resources, United States—Alaska

## 53-3944

**Role of glaciers and glacial deposits in the Kenai River watershed and the implications for aquatic habitat.**

Dorava, J.M., Scott, K.M., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.3-8, 14 refs. Glacial hydrology, Meltwater, Glacial rivers, Glacial lakes, Glacial deposits, Ecosystems, Ecology, Animals, United States—Alaska—Kenai River

## 53-3945

**Reconnaissance study of the chemistry of natural waters draining chromite-bearing ultramafic complexes in Alaska.**

Taylor, C.D., Meier, A.L., D'Angelo, W.M., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.9-16, 28 refs. Mining, Tailings, Minerals, Ground water, Springs (water), Water pollution, Water chemistry, Hydrogeochemistry, United States—Alaska

## 53-3946

**Age, isotopic, and geochemical studies of the Fortyseven Creek Au-As-Sb-W prospect and vicinity, southwestern Alaska.**

Gray, J.E., Gent, C.A., Snee, L.W., Theodorakos, P.M., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.17-29, 47 refs.

Geological surveys, Exploration, Minerals, Gold, Natural resources, Geochemistry, Hydrogeochemistry, United States—Alaska

## 53-3947

**Geology and gold resources of the Stuyahok area, Holy Cross quadrangle, southwestern Alaska.**

Miller, M.L., Bundtzen, T.K., Keith, W.J., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.31-49, 24 refs.

Geological surveys, Exploration, Minerals, Gold, Natural resources, Geochemistry, United States—Alaska—Stuyahok

## 53-3948

**Petrology, geochemistry, age, and significance of two foliated intrusions in the Fairbanks district, Alaska.**

Newberry, R.J., Bundtzen, T.K., Mortensen, J.K., Weber, F.R., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.117-129, 44 refs. Geological surveys, Exploration, Geochemistry, Lithology, Geochronology, Minerals, Gold, United States—Alaska—Fairbanks

## 53-3949

**New <sup>40</sup>Ar/<sup>39</sup>Ar dates for intrusions and mineral prospects in the eastern Yukon-Tanana terrane, Alaska—regional patterns and significance.**

Newberry, R.J., Lauer, P.W., Burleigh, R.E., Solie, D.N., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.131-159, 71 refs. Geological surveys, Exploration, Geochemistry, Lithology, Geologic structures, Minerals, Gold, Natural resources, Geochronology, Radioactive age determination, Soil dating, United States—Alaska

## 53-3950

**U.S. Geological Survey reports on Alaska released in 1996.**

Galloway, J.P., Toussaint, S., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.193-196, 101 citations.

Bibliographies, Research projects, Geological surveys, Exploration, United States—Alaska

## 53-3951

**Reports about Alaska in non-USGS publications released in 1996 that include USGS authors.**

Galloway, J.P., Toussaint, S., *U.S. Geological Survey. Professional paper*, 1998, No.1595, Geologic studies in Alaska by the U.S. Geological Survey, 1996. Edited by J.E. Gray and J.R. Riehle, p.197-200, 87 citations.

Bibliographies, Research projects, Geological surveys, Exploration, United States—Alaska

## 53-3952

**Slabs and wind.** [Plaques et vent]

Duclos, A., *Neige et avalanches*, Mar. 1999, No.85, p.2-5,32, In French with English summary. Wind factors, Wind erosion, Snow erosion, Snowdrifts, Snow cover stability, Avalanche formation, Snow slides, Avalanche forecasting

## 53-3953

**Judgement about a mortal avalanche accident on a ski run.** [Avalanche à Val Thorens: déclenchement sans faute]

Sarraz-Bournet, P., *Neige et avalanches*, Mar. 1999, No.85, p.6-7,32, In French with English summary. Avalanches, Accidents, Avalanche triggering, Avalanche forecasting, Safety, Legislation, France

## 53-3954

**Ski injuries in 1998.** [Accidentologie du ski—hiver 1997-1998]

Laporte, J.D., Binet, M.H., *Neige et avalanches*, Mar. 1999, No.85, p.8-12,32, In French with English summary. Skis, Accidents, Safety, France

## 53-3955

**Realization, use and limit of the CLPA.** [Réalisation, usage et limites de la Carte de Localisation Probable des Avalanches]

Borrel, G., *Neige et avalanches*, Mar. 1999, No.85, p.13-18,32, In French with English summary. Snow cover stability, Terrain identification, Aerial surveys, Mapping, Avalanche forecasting, Data processing, France

## 53-3956

**Question about stability.** [Stabilité en question]

Duclos, A., *Neige et avalanches*, Mar. 1999, No.85, p.19,32, In French with English summary. Snow cover stability, Avalanche triggering, Blasting

53-3957

**Avalanche dog handler education: which dog to choose.** [Formation maître chien d'avalanches: quel chien choisir]

Stinglhamber, X., *Neige et avalanches*, Mar. 1999, No.85, p.22-23,32, In French with English summary. Avalanches, Accidents, Rescue operations, Animals

53-3958

**ANENA's training courses 1998.** [Formations 1998]

Chavasse, B., *Neige et avalanches*, Mar. 1999, No.85, p.24-26,32, In French with English summary. Avalanches, Avalanche triggering, Blasting, Safety, Rescue operations, Animals, Education, France

53-3959

**Hours of work and rest of Canadian ice navigators on board foreign-registered vessels in arctic waters.**

Buck, L., Brooks, J., Webb, R., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Mar. 1998, TP 13207E, 42p. + appends., With French summary. 25 refs.

Ice navigation, Human factors, Labor factors, Health, Safety

53-3960

**Investigation of transient hydrodynamic phenomena in ship-ice ramming.**

Phillips, L.D., Tanaka, H., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Nov. 1997, TP 12954E, 86p. + appends., MIC-99-00013, With French summary. 23 refs.

Icebreakers, Ice breaking, Ice solid interface, Ice navigation, Ice loads, Ice pressure, Metal ice friction, Structural analysis, Hydrodynamics, Impact tests, Mathematical models, Computer programs

53-3961

**Protocol for the characterization of explosives-contaminated sites.**

Thiboutot, S., et al, MP 5335, *Canada. Defence Research Establishment Valcartier, Quebec. Report*, Apr. 1998, DREV-R-9721, 73p., With French summary. 75 refs.

Military facilities, Site surveys, Explosives, Soil pollution, Soil tests, Soil analysis, Chemical analysis, Ground water, Water pollution, Health, Canada

Many activities of the Canadian Forces, such as firing, demolition procedures and destruction of obsolete ammunition by open burning and open detonation may lead to the dispersion of energetic compounds in the environment. These compounds are being closely examined due to their highly specific physical, chemical and toxicological properties. In Canada, limited effort has been devoted to examine this particular environmental threat. In this context, R&D was dedicated towards the establishment of a protocol that will allow reliable and safe characterization of sites potentially contaminated with explosives. This protocol was based on Defence Research Establishment Valcartier research efforts and expertise in the chemistry of energetic materials, on the current existing literature, on the experience gained in practical field sampling and on collaborative work with BRI and CRREL. The protocol detailed in the present report covers all aspects related to surface and subsurface sampling, extraction, analysis, field-screening methods and environmental fate related with these specific contaminants. Furthermore, safety procedures are described that take into account the explosive and toxic nature of these compounds. This protocol will serve as a reference guide for future sampling campaigns on sites that are potentially contaminated with explosives.

53-3962

**Development of laboratory test procedures to replace field anti-icing fluid tests (snow equivalence tests).**

Bernardin, S., Dubuisson, C., Laforte, J.L., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Nov. 1997, TP 13141E, 109p., MIC-98-07480, With French summary.

Aircraft icing, Ice accretion, Icing rate, Ice forecasting, Snowstorms, Snowfall, Chemical ice prevention, Safety, Environmental tests

53-3963

**Fluid behaviour simulation: modelling of water diffusion in ground aircraft de/anti-icing fluids for numerical prediction of laboratory holdover time.**

Louchez, P.R., Zouzou, A., Liu, L., Sasseville, R., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Oct. 1997, TP 13113E, 44p. + append., MIC-99-00105, With French summary. 17 refs.

Aircraft icing, Ice accretion, Ice detection, Chemical ice prevention, Ice removal, Icing rate, Ice forecasting, Safety, Environmental tests, Mathematical models

53-3964

**Antarctic automatic weather station data for the calendar year 1996.**

Keller, L.M., Weidner, G.A., Stearns, C.R., Whitaker, M.T., Holmes, R.E., Madison, University of Wisconsin, Space Science and Engineering Center, 1999, 47p.

Polar atmospheres, Marine atmospheres, Weather stations, Meteorological data, Data processing, Data transmission, Air temperature, Atmospheric pressure, Wind velocity, Wind direction, Antarctica

53-3965

**Influences of solar-terrestrial events on atmospheric environment over Syowa Station, Antarctica: a preliminary analysis of radiosonde observations.**

Watanabe, T., NIPR Symposium on Upper Atmosphere Physics. Proceedings. No.9, Tokyo, National Institute of Polar Research, Feb. 1996, p.42-55, 9 refs.

Solar activity, Polar atmospheres, Atmospheric circulation, Atmospheric composition, Ozone, Air temperature, Statistical analysis, Antarctica—Showa Station

53-3966

**ENSO events and interannual variations of winter sea-ice in the Greenland, the Kara and the Barents Seas.**

Wu, B.Y., Gao, D.Y., Huang, R.H., *Chinese science bulletin*, Aug. 1997, 42(16), p.1382-1385, 5 refs.

Atmospheric circulation, Ocean currents, Air ice water interaction, Sea ice distribution, Ice conditions, Drift, Ice cover effect, Greenland Sea, Barents Sea, Russia—Kara Sea

53-3967

**Impurity effects in the premelting of ice.**

Wettlaufer, J.S., *Physical review letters*, Mar. 22, 1999, 82(12), p.2516-2519, 22 refs.

Ice melting, Doped ice, Impurities, Superheated ice, Ice surface, Films, Interfacial tension, Phase transformations, Ice models, Mathematical models

53-3968

**Changes in photosynthetic carbon assimilation in antarctic sea-ice diatoms during spring bloom: variation in synthesis of lipid classes.**

Palmisano, A.C., Lizotte, M.P., Smith, G.A., Nichols, P.D., White, D.C., Sullivan, C.W., *Journal of experimental marine biology and ecology*, 1988, Vol.116, p.1-13, 31 refs.

Sea ice, Ice water interface, Ice cover effect, Marine biology, Algae, Plant ecology, Plant physiology, Photosynthesis, Nutrient cycle, Biomass, Antarctica—McMurdo Sound

53-3969

**System and method for detection of frazil ice on underwater grating.**

Yankielun, N.E., MP 5336, *U.S. Patent Office. Patent*, May 4, 1999, 8 col., USP-5,900,820, 13 refs.

Water intakes, Frazil ice, Ice accretion, Ice loads, Ice detection, Monitors, Telemetering equipment  
A system for detecting accretion of frazil ice on underwater gratings includes a housing for disposition beneath a water surface and spaced from but proximate an underwater intake grating. A pair of parallel electrically conductive bars are mounted side-by-side in the housing and extend therefrom. The bars are in communication with an electromagnetic wave generator in the housing. A coaxial transmission line is connected at a first end to the housing and in communication with the pair of bars for extension from the housing upwardly above the water surface. A monitoring station is disposed above the water surface for receiving signals from the bars, the monitoring station having a second end of the transmission line fixed thereto. The wave generator propagates electromagnetic waves to the bars for further travel to distal ends of the bars, and back to the

housing and thence to the monitoring station. The monitoring station is adapted to compute wave round trip travel time in the bars and to compute changes in the round trip travel time, from which is determined absence, presence, and build-up of frazil ice on the bars, thereby providing an indication of same on the grating.

53-3970

**Vertical penetration of floating ice sheets.**

Sodhi, D.S., MP 5337, *International journal of solids and structures*, Nov. 1998, 35(31-32), p.4275-4294, 29 refs.

Ice cover strength, Bearing strength, Ice elasticity, Ice loads, Ice creep, Ice deformation, Ice cracks, Ice breaking, Penetration tests, Strain tests

Existing failure criteria for the bearing capacity of floating ice sheets predict the load for the occurrence of the first radial crack or a circumferential crack, when the maximum stress obtained from an elastic analysis in the ice equals the tensile strength. From full-scale and small-scale tests, the ultimate load to cause complete penetration of a floating ice sheet is much higher than that to cause the first radial crack. This can be attributed to wedging action during deformation of a radially cracked ice sheet. The author presents three approaches taken to determine the ice penetration force: plastic limit analysis, small-scale experiments and full-scale measurements in the field. Small-scale experiments were conducted with freshwater ice in a laboratory basin to understand the wedging action during the vertical loading of floating ice sheets. Results of the following experiments are presented: beams with fixed ends, paired cantilever beams arranged free-end to free-end and loaded together, beams with an apparatus inserted between the free ends of paired cantilever beams to measure the in-plane force during vertical loading, and vertical downward loading of floating ice sheets with fixed and free boundaries. Analysis of the data from the beam tests reveals that the wedging action results in the development of wedging pressure in the top or bottom third of the ice thickness, and this results in a resisting moment that counters the deformation of a cracked ice sheet. An ice sheet attached to the basin wall inhibits the propagation of radial cracks because of the wedging action, whereas an ice sheet free at the edges from the surrounding ice sheet fails by the propagation of radial cracks all the way to the ice sheet's free boundary. The difference between the two breakthrough loads of the free and the fixed ice sheets can be attributed to wedging action. The results of the beam tests are used in the results of plastic limit analysis to predict the breakthrough loads of floating ice sheets, which are in agreement with loads measured during full-scale and small-scale experiments.

53-3971

**Ice-core records of global climate and environment changes.**

Delmas, R.J., *Indian Academy of Sciences. Proceedings. Earth and planetary sciences*, Dec. 1998, 107(4), p.307-319, 82 refs.

Ice sheets, Ice cores, Glacial meteorology, Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Ice composition, Global change, Paleoclimatology, Greenland, Antarctica

53-3972

**Closure for analysis of boundary layer turbulence correlations.**

Treviño, G., Andreas, E.L., MP 5338, Conference on Boundary Layers and Turbulence, 13th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.609-611, 7 refs.

Atmospheric boundary layer, Turbulent boundary layer, Turbulence, Mathematical models, Statistical analysis

53-3973

**Greenland ice sheet—a model for its culmination and decay during and after the last glacial maximum.**

Funder, S., Hansen, L., *Geological Society of Denmark. Bulletin*, 1996, 42(2), p.137-152, With Danish summary. 75 refs.

Ice sheets, Glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Glacier melting, Calving, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Sea level, Isostasy, Geochronology, Global change, Paleoclimatology, Greenland

53-3974

Engineering-geocryological monitoring of the Yamsoveysk gas condensate field in northern West Siberia. [Opyt provedeniia inzhenerno-geokriologicheskogo monitoringa na Iamsoveyskom gazokondensatnom mestorozhdenii na severe Zapadnoi Sibiri]

Buldovich, S.N., Garagulia, L.S., Ospennikov, E.N., *Geokologiya; inzhenernaia geologiya, gidrogeologiya, geokriologiya*, Nov.-Dec 1998, No.6, p.33-40, In Russian. 3 refs.

Engineering geology, Geocryology, Natural gas, Gas wells, Active layer, Frost heave, Permafrost bases, Piles, Cold weather construction, Russia—Siberia

53-3975

Development of floodplain taliks in the Kolyma River valley and fluvial water temperature. [Razvitiye poimennykh talikov v doline r. Kolyma i temperatura rechnykh vod]

Mikhailov, V.M., *Geokologiya; inzhenernaia geologiya, gidrogeologiya, geokriologiya*, Nov.-Dec 1998, No.6, p.100-110, In Russian. 17 refs.

Taliks, Floodplains, River basins, Valleys, Rivers, Water temperature, Stream flow, Convection, Heat transfer, Russia—Kolyma River

53-3976

Identification of phase equilibrium parameters of freezing soil. [Opredeleniye parametrov fazovogo ravnovesiya promerzaiushchego grunta]

Konovalov, A.A., *Geokologiya; inzhenernaia geologiya, gidrogeologiya, geokriologiya*, Nov.-Dec 1995, No.6, p.50-64, In Russian. 16 refs.

Soil freezing, Phase transformations, Ground thawing, Freezing points, Loams, Sands, Soil water, Analysis (mathematics), Salinity, Soil temperature, Freeze thaw cycles

53-3977

Typification of taliks in Yamal. [Tipizatsiya talikov Iamala]

Fotiev, S.M., *Geokologiya; inzhenernaia geologiya, gidrogeologiya, geokriologiya*, Nov.-Dec 1995, No.6, p.65-73, In Russian. 4 refs.

Taliks, Classifications, Geocryology, Russia—Yamal Peninsula

53-3978

Using a method of artificially freezing soil during construction of urban engineering networks in saturated sands. [Primeneniye metoda iskusstvennogo zamorazhivaniia gruntov pri stroitel'stve gorodskikh inzhenernykh setei v vodonasyschennykh peskakh]

Gevorkian, S.G., *Geokologiya; inzhenernaia geologiya, gidrogeologiya, geokriologiya*, Nov.-Dec 1995, No.6, p.102-111, In Russian. 14 refs.

Artificial freezing, Soil freezing, Sands, Air temperature, Stefan problem, Polymers, Concrete admixtures, Precast concretes, Countermeasures, Heat transfer, Subsurface structures, Cold weather construction, Construction materials, Russia—Yamal Peninsula

53-3979

Correlation of stratigraphic events of Upper Pleistocene in central and peripheral parts of the last glaciation.

Satkūnas, J., ed, Robertsson, A.M., ed, Abstract volume and excursion guide. International Workshop, Vilnius, Lithuania, Oct. 3-6, 1996, Vilnius, Geological Society of Lithuania, Nov. 1996, 88p., Refs. passim. Abstracts and papers.

DLC QE697.C725 1996

Pleistocene, Paleoclimatology, Stratigraphy, Palynology, Correlation, Glaciation, Lithuania, Sweden, United Kingdom—England, Latvia, Estonia, Denmark, Finland

53-3980

Thermal processes and ice formation in rivers. Matoušek, V., Papers and Studies, No.180, Prague, Water Research Institute, 1990, 146p., 73 refs. DLC GB1398.2.M374 1990

River ice, Hydrothermal processes, Ice formation, Frazil ice, Streams, Thermal regime, Stream flow, Mathematical models, Heat transfer, Ice cover, Freeze-up, Ice crossings, Air ice water interaction, Czech Republic

53-3981

Procedure for determining performance of thin polymer overlays on Alberta bridge decks. Carter, P.D., In-Place Performance of Polymer Concrete Overlays. ACI publication. Edited by S.L. Marusin, Farmington Hills, MI, American Concrete Institute, 1997, p.107-121, SP-169, 4 refs. DLC TE220.3.I5 1997

Bridges, Concrete pavements, Concrete durability, Polymers, Protective coatings, Corrosion, Waterproofing, Weatherproofing, Freeze thaw tests, Frost resistance, Cold weather performance, Canada—Alberta

53-3982

Premixed epoxy polymer concrete bridge deck overlays.

Dimmick, F.E., Sr., In-Place Performance of Polymer Concrete Overlays. ACI publication. Edited by S.L. Marusin, Farmington Hills, MI, American Concrete Institute, 1997, p.146-171, 5 refs. DLC TE220.3.I5 1997

Bridges, Concrete pavements, Concrete durability, Concrete admixtures, Polymers, Protective coatings, Freeze thaw tests, Frost protection, Weatherproofing

53-3983

Abrasion characteristics of MMA resin mortar overlaid on a pavement in a cold environment. Omata, F., Kawakami, M., Kagaya, M., Tokuda, H., In-Place Performance of Polymer Concrete Overlays. ACI publication. Edited by S.L. Marusin, Farmington Hills, MI, American Concrete Institute, 1997, p.180-198, 5 refs. DLC TE220.3.I5 1997

Concrete pavements, Concrete admixtures, Protective coatings, Concrete durability, Resins, Polymers, Abrasion, Hardness tests, Cold weather tests, Road maintenance, Japan

53-3984

Role of catchment hydrology in the characterization of water quality in glacial/boreal lakes. Thierfelder, T., *Journal of hydrology*, Mar. 8, 1999, 216(1-2), p.1-16, 61 refs.

Watersheds, Glacial lakes, Lake water, Water chemistry, Hydrogeochemistry, Drainage, Statistical analysis

53-3985

Groundwater monitoring and isotope investigation of contaminated wastewater from an open pit mining lake.

Eccarius, B., *Environmental geosciences*, 1998, 5(4), p.156-161, 13 refs.

Coal, Mining, Pits (excavations), Water pollution, Soil pollution, Waste disposal, Ground water, Hydrogeology, Hydrogeochemistry, Land reclamation, Germany

53-3986

Structural effects in low temperature radioluminescence of aqueous ionic systems.

Wypych, M., Kroh, J., *Radiation physics and chemistry*, May 11, 1999, 54(6), p.567-574, 26 refs.

Ice spectroscopy, Ice composition, Doped ice, Impurities, Molecular structure, Molecular energy levels, Frozen liquids, Ionization, Low temperature research

53-3987

Surface radiation measurements from polar stations.

Liu, Q., Konig-Langlo, G., Simmer, C., *Physics and chemistry of the earth*, 1998, 23(5/6), p.593-598, 8 refs.

Polar atmospheres, Solar radiation, Insolation, Radiation balance, Albedo, Radiation measurement, Norway—Spitsbergen, Antarctica—Neumayer Station

53-3988

Snow modelling in the Hadley Centre GCM.

Essery, R., *Physics and chemistry of the earth*, 1998, 23(5/6), p.655-659, 32 refs.

Snow cover distribution, Snow line, Snow heat flux, Snow cover effect, Snow air interface, Albedo, Cloud cover, Forest canopy, Atmospheric circulation, Global warming, Computerized simulation

53-3989

Energy balance model of seasonal snow evolution. Fernández, A., *Physics and chemistry of the earth*, 1998, 23(5/6), p.661-666, 4 refs.

Snow hydrology, Snow water content, Snow melting, Snowmelt, Snow heat flux, Snow surface temperature, Snow air interface, Albedo, Mathematical models, Runoff forecasting

53-3990

Transport of air pollutants from the boundary layer to the free troposphere over complex terrain.

Lehning, M., Richner, H., Kok, G.L., *Physics and chemistry of the earth*, 1998, 23(5/6), p.667-672, 15 refs.

Atmospheric boundary layer, Atmospheric circulation, Atmospheric composition, Air pollution, Ozone, Switzerland, Hong Kong

53-3991

WMO statement on the status of the global climate in 1998. Geneva, Switzerland, World Meteorological Organization, 1999, 11p., WMO-No.896.

Atmospheric circulation, Atmospheric disturbances, Global warming, Storms, Floods, Accidents, Cost analysis

53-3992

Properties of frozen ground and simulation of soil freezing mechanism. [Toketsu jiban to tojo ni kansuru kenkyu]

Takano, M., Inoue, M., Nakagawa, S., *Nippon kokan giho (Japan Steel Pipe Corporation technical report)*, 1979, No.83, p.351-362, In Japanese with English summary. 23 refs.

Foundations, Permafrost beneath structures, Subgrade soils, Soil freezing, Soil water migration, Freezing front, Frost heave, Permafrost heat transfer, Frozen ground thermodynamics, Frozen ground compression, Frozen ground strength, Mathematical models

53-3993

Envisioning the northern dimension: toward an Arctic of regions.

Joint Seminar and Workshop of the Barents Regional Council and the Northern Forum, Rovaniemi, Finland, Oct. 15-16, 1998, Hukkinen, J., ed, Heininen, L., ed, Lange, M.A., ed, Langlais, R., ed, *University of Lapland, Rovaniemi, Finland. Arctic Centre. Reports*, 1999, No.28, 112p.

Regional planning, International cooperation, Economic development, Environmental protection

53-3994

European North in the 1990s: a region of multifunctional and conflicting interests. [Euroopan pohjoinen 1990-luvulla: monilottelusten ja ristiriitaisten intressien alue]

Heininen, L., *Arktisen keskuksen tiedotteita (University of Lapland, Rovaniemi, Finland. Arctic Centre. Reports)*, 1999, No.30, 407p. + maps, In Finnish with extended English summary p.373-407. Refs. p.336-372.

Regional planning, International cooperation, Economic development, Environmental protection

53-3995

Modernization of the pilotage certification process in the Laurentian pilotage region.

Friend, R.G., McKnight, D.A., Vachon, S., *Transport Canada. Transportation Development Centre, Montreal. Publication*, Jan. 1998, TP 13145E, 125p. + append., MIC-99-03001, With French summary. 38 refs.

Ships, Navigation, Safety, Education, Environment simulation, Legislation, Standards, Canada

## 53-3996

**Simulations of quasi-statically deforming granular materials: applications to the modelling of broken-ice fields.**

Corriveau, D., Montreal, Quebec, McGill University, 1997, 110p., National Library of Canada, Ottawa, Canadian theses MQ-29586, M.Eng. thesis. With French summary. 55 refs.

Ice floes, Ice cover strength, Ice elasticity, Ice plasticity, Ice pressure, Ice friction, Ice loads, Ice deformation, Ice breaking, Ice models, Ice forecasting, Strain tests, Stress strain diagrams, Computerized simulation, Mathematical models

## 53-3997

**Modelling sea ice as a granular material, with applications to climate variability.**

Tremblay, L.B., Montreal, Quebec, McGill University, 1996, 102p., National Library of Canada, Ottawa, Canadian theses NQ-30406, Ph.D. thesis. With French summary. 76 refs.

Air ice water interaction, Atmospheric circulation, Ocean currents, Ice heat flux, Sea ice distribution, Ice conditions, Ice cover thickness, Drift, Ice friction, Ice deformation, Ice models, Paleoclimatology, Computerized simulation, Mathematical models

## 53-3998

**Theoretical and numerical study of thin film and ice accretion dynamics on aircraft wing surfaces.**

Tsao, J.C., Ames, Iowa State University, 1998, 131p., University Microfilms order No.9841091, Ph.D. thesis. Refs. passim.

Aircraft icing, Ice accretion, Glaze, Ice loads, Ice air interface, Supercooled clouds, Cloud droplets, Water films, Surface roughness, Air flow, Viscous flow, Turbulent flow, Mathematical models

## 53-3999

**Nonlinear aircraft simulation of ice contaminated tailplane stall.**

Hiltner, D.W., Columbus, Ohio State University, 1998, 233p., University Microfilms order No.9900844, Ph.D. thesis. 28 refs.

Aircraft icing, Ice accretion, Ice loads, Ice air interface, Air flow, Computerized simulation, Mathematical models

## 53-4000

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Lu, S.N., Potsdam, NY, Clarkson University, 1998, 213p., University Microfilms order No.9901314, Ph.D. thesis. 99 refs.

River ice, Ice breakup, Ice jams, Ice friction, Ice deformation, Ice models, Ice forecasting, Ice water interface, River flow, Hydrodynamics, Mathematical models

## 53-4001

**Sea ice and climate sensitivity.**

Kravtsov, S.V., Tallahassee, Florida State University, 1998, 259p., University Microfilms order No.9905414, Ph.D. thesis. Refs. p.241-257.

Sea ice distribution, Air ice water interaction, Ice heat flux, Ice models, Ice cover effect, Ocean currents, Water transport, Water temperature, Salinity, Atmospheric circulation, Heat balance, Hydrologic cycle, Global change, Paleoclimatology, Computerized simulation

## 53-4002

**Modeling the thickness distribution of arctic sea ice.**

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Sea ice distribution, Ice cover thickness, Ice conditions, Pressure ridges, Ice openings, Drift, Albedo, Ice heat flux, Air ice water interaction, Ice models, Atmospheric circulation, Ocean currents, Global change, Computerized simulation, Mathematical models

## 53-4003

**X-ray topography of freshwater ice.**

Hu, X.H., Hanover, NH, Dartmouth College, Thayer School of Engineering, 1998, 123p., University Microfilms order No.9908247, Ph.D. thesis. Refs. p.113-123.

Ice crystal structure, Ice crystal optics, Ice microstructure, Ice strength, Ice plasticity, Ice creep, Ice deformation, Ice cracks, Plastic flow, Stress strain diagrams, Dislocations (materials), X ray analysis, Mathematical models

## 53-4004

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## 53-4005

**Simulation of the European ice sheet through the last glacial cycle and prediction of future glaciation.**

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Ice models, Mathematical models, Computerized simulation, Ice cover, Subglacial observations, Climatic changes, Ice water interface, Ice forecasting, Glaciation, Sweden

## 53-4006

**Predicting the cold resistance of structures and efficiency of equipment in the North. [Prognozirovanie khladostoičnosti konstruktiv i rabotoposobnosti tekhniki na Severe]**

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Cold weather operation, Forecasting, Cold weather performance, Construction equipment, Plastic deformation, Metals, Cracking (fracturing), Temperature effects, Loads (forces), Low temperature tests, Analysis (mathematics), Fatigue (materials)

## 53-4007

**Rapid thinning of parts of the southern Greenland ice sheet.**

Krabill, W., et al, *Science*, Mar. 5, 1999, 283(5407), p.1522-1524, 10 refs.

Ice creep, Ice sheets, Ice cover thickness, Aerial surveys, Greenland

## 53-4008

**Macrobenthic structure and carbon demand at the continental margin off East Greenland. [Struktur und Kohlenstoffbedarf des Makrobenthos am Kontinentalhang Ostgrönlands]**

Seiler, D., *Berichte zur Polarforschung*, 1999, No.307, 96p., In German with English summary. Refs. p.70-81.

Ecosystems, Biomass, Marine biology, Sea ice, Ice cover effect, Nutrient cycle, Bottom sediment, Greenland

## 53-4009

**Annealing and sublimation of noble gas and water ice films.**

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DLC QC278.J68 Vol.111 1998

Ice crystal structure, Amorphous ice, Ice sublimation, Ice vapor interface, Vapor pressure, Water films, Low temperature research, Cryogenics

## 53-4010

**Structural safety evaluation of Gerber Arch Dam.**

Barrie, R.E., International Conference on Hydropower, San Francisco, CA, July 25-28, 1995. Proceedings. *Waterpower'95*, Vol.3. Edited by J.J. Cassidy, New York, American Society of Civil Engineers, 1995, p.2147-2156, 4 refs.

DLC TK1081.W36 Vol.3 1995

Dams, Concrete durability, Concrete strength, Frost action, Frost resistance, United States—Oregon—Gerber Dam

## 53-4011

**Pneumatic conveying of ice particles through mine-shaft pipelines.**

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DLC TP156.P3P63 Vols. 84-85 1995

Mine shafts, Ice thermal properties, Ice refrigeration, Cooling systems, Pipelines, Pipe flow

## 53-4012

**Real time forecast of snowcover development and meltwater release. First results of the Project SNOW-D. [Echtzeitvorhersage der Schneedeckentwicklung und der Wasserabgabe aus der Schneedecke. Erste Ergebnisse aus dem Projekt SNOW-D]**

Rachner, M., Matthäus, H., Schneider, G., *Deutsche gewässerkundliche Mitteilungen*, June 1997, 41(3), p.98-106, In German with English summary. 36 refs.

DLC GB651.D4 Vol.41 1997

Snow water equivalent, Forecasting, Snowmelt, Snow cover distribution, Simulation, Meltwater, Germany

## 53-4013

**How do Großwetterlagen become flood-producing weather situations in Bavaria? [Was macht eine Großwetterlage zur Hochwasserlage in Bayern?]**

Kästner, W., *Deutsche gewässerkundliche Mitteilungen*, June 1997, 41(3), p.107-112, In German with English summary. 14 refs.

DLC GB651.D4 Vol.41 1997

Synoptic meteorology, Flood forecasting, Snow cover effect, Snowmelt, Floods, Topographic effects, Frozen ground, Germany

## 53-4014

**Radiation budget and surface temperature of snowcover in forests and on open landscapes. [Strahlungshaushalt und Oberflächentemperatur einer Schneedecke im Wald und im Freiland]**

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Radiation balance, Snow cover effect, Surface temperature, Forest land, Albedo, Air temperature, Snow depth, Snow air interface, Germany

## 53-4015

**Use of a one-dimensional snow cover model to analyze measured snow depth and snow temperature data from southern Finland.**

Koivusalo, H.J., Burges, S.J., *U.S. Bureau of Reclamation, Washington, D.C. Office of Water Research. Report*, Mar. 1996, 109p., PB96-187851, 36 refs. Also published as Washington University, Seattle, Department of Civil Engineering report no. Water Resources SER/TR-150.

Models, Snow cover, Snow depth, Snow temperature, Measurement, Mass transfer, Snow ice interface, Finland

## 53-4016

**Hydrometeorological regime of the Kara, Laptev, and East-Siberian Seas.**

Pavlov, V.K., et al, *University of Washington, Seattle. Applied Physics Laboratory. Technical memorandum*, Jan. 1996, APL-UW-TM-1-96, 179p., ADA-304 976, 86 refs.

Ocean currents, Water pollution, Radioactive wastes, Sea water, Tidal currents, Water flow, Russia—Kara Sea, Russia—Laptev Sea, Arctic Ocean, Russia—East Siberian Sea



## 53-4017

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Meltwater, Water pollution, Snowmelt, Infrared spectroscopy, Water storage, Snow water content, Sampling, United States—Alaska

## 53-4018

**Optimal routing of ice reconnaissance aircraft.** Sposato, J.J., Monterey, CA, Naval Postgraduate School, Sep. 1995, 57p., ADA-306 482, M.S. thesis. 15 refs.  
Aircraft, Aerial surveys, Ice reporting, Ice conditions, Ice surveys, North Atlantic Ocean

## 53-4019

**Nonsorted patterned ground on mountains in the northern highlands of Scotland.** Ballantyne, C.K., *Biuletyn peryglacjalny*, 1986, No.30, p.15-34, 42 refs.  
DLC QE1.B55 1986 No.30-31  
Patterned ground, Regolith, Hummocks, Frost action, United Kingdom—Scotland

## 53-4020

**Late Pleistocene permafrost phenomena in the European part of the USSR and their significance for paleoclimatic reconstructions.** Berdnikov, V.V., *Biuletyn peryglacjalny*, 1986, No.30, p.35-43, 13 refs.  
DLC QE1.B55 1986 No.30-31  
Pleistocene, Paleoclimatology, Wedges, Permafrost distribution

## 53-4021

**Pleistocene periglacial structures in the Ebro terrace at Saragossa. [Pleistozäne periglazialstrukturen in den ebroterrassen bei Zaragoza]** Borsche, K.U., *Biuletyn peryglacjalny*, 1986, No.30, p.45-56, In German with English summary. 35 refs.  
DLC QE1.B55 1986 No.30-31  
Pleistocene, Periglacial processes, Geomorphology, Geocryology, Cryoturbation, Spain—Ebro River, Spain—Saragossa

## 53-4022

**Propositions for the legend of a map showing the distribution of fossil periglacial phenomena as evidence for permafrost at the maximum of the last glaciation.** Karte, J., Liedtke, H., *Biuletyn peryglacjalny*, 1986, No.30, p.61-66.  
DLC QE1.B55 1986 No.30-31  
Periglacial processes, Permafrost distribution, Maps, Mapping, Paleoclimatology, Glaciation, Fossil ice

## 53-4023

**Frequency of relic frost-fissure structures and prediction of polygon pattern: a quantitative approach.** Maizels, J.K., *Biuletyn peryglacjalny*, 1986, No.30, p.67-89, Refs. p.87-89.  
DLC QE1.B55 1986 No.30-31  
Patterned ground, Ice wedges, Paleoclimatology, Polygonal topography, Permafrost distribution, Air temperature, United Kingdom—Scotland

## 53-4024

**Dowoo—a new type of earth mounds in continental permafrost domain (central Mongolia).** Nowaczyk, B., *Biuletyn peryglacjalny*, 1986, No.30, p.111-123, 33 refs.  
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Permafrost distribution, Pingos, Geomorphology, Geocryology, Permafrost origin, Mongolia

## 53-4025

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DLC QE1.B55 1986 No.30-31  
Desert soils, Soil patterns, Tundra soils, Soil classification, Soil formation, Canada—Northwest Territories—Bathurst Island

## 53-4026

**Intensity versus duration of bedrock weathering under periglacial conditions in high Arctic Canada.** Watts, S.H., *Biuletyn peryglacjalny*, 1986, No.30, p.141-152, Refs. p.150-152.  
DLC QE1.B55 1986 No.30-31  
Bedrock, Weathering, Periglacial processes, Glacier ice, Fracturing, Porosity, Microstructure, Lithology, Geomorphology, Canada—Northwest Territories—Ellesmere Island, Canada—Northwest Territories—Somerset Island

## 53-4027

**Early Vistulian permafrost occurrence in north-west Poland.** Kozarski, S., *Biuletyn peryglacjalny*, 1986, No.31, p.163-170, 33 refs.  
DLC QE1.B55 1986 No.30-31  
Periglacial processes, Permafrost distribution, Fossil ice, Ice wedges, Geomorphology, Geocryology, Paleoclimatology, Poland

## 53-4028

**Kurums.** Romanovskii, N.N., Turin, A.I., *Biuletyn peryglacjalny*, 1986, No.31, p.249-259, 38 refs.  
DLC QE1.B55 1986 No.30-31  
Rock streams, Periglacial processes, Geocryology, Russia—Siberia, Russia—Far East

## 53-4029

**Role of the Vistulian and Holocene in the transformation of the relief of Poland.** Starkel, L., *Biuletyn peryglacjalny*, 1986, No.31, p.261-273, Refs. p.270-273.  
DLC QE1.B55 1986 No.30-31  
Periglacial processes, Topographic features, Slopes, Geomorphology, Paleoclimatology, Glacial geology, Poland

## 53-4030

**Factors affecting polar desert soil development in the High Arctic.** Tedrow, J.C.F., *Biuletyn peryglacjalny*, 1986, No.31, p.275-282, 32 refs.  
DLC QE1.B55 1986 No.30-31  
Desert soils, Soil formation, Frost action, Soil patterns, Tundra soils, Meadow soils, Soil classification, Canada—Northwest Territories—Bathurst Island, Canada—Northwest Territories—Prince Patrick Island

## 53-4031

**Effect of relief on the type of periglacial slope deposits in the Łódź. [L'influence du relief sur le caractère des dépôts de versant periglaciaire dans la région de Łódź]** Turkowska, K., Wiczorkowska, J., *Biuletyn peryglacjalny*, 1986, No.31, p.293-309, In French. 47 refs.  
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Periglacial processes, Slope processes, Topographic features, Sands, Stratigraphy, Poland—Łódź

## 53-4032

**History of hydraulic engineering in the Swiss Alps. [Histoire de l'aménagement des eaux dans les Alpes suisses]** Vischer, D.L., Raemy, F., *Gas, Wasser, Abwasser (Gaz, eau, eau usée)*, Dec. 1998, 78(12), p.978-985, In French with German and English summaries. 9 refs.  
History, Water supply, Channels (waterways), Water pipelines, Hydraulic structures, Irrigation, Transportation, Switzerland

## 53-4033

**Distribution of permafrost in Finland.** Seppälä, M., *Geological Society of Finland. Bulletin*, 1997, No.69, Part 1-2, p.87-96, 34 refs.  
Permafrost surveys, Permafrost distribution, Periglacial processes, Frost mounds, Permafrost indicators, Permafrost thickness, Vegetation patterns, Finland

## 53-4034

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Periglacial processes, Frost action, Patterned ground, Permafrost indicators, Frost penetration, Freezing indexes, Degree days, Finland

## 53-4035

**Freezing point depression conditioned by crystal size and shape. [Über die durch anomale Kristallgestalt sowie durch Limitierung der Kristallgröße bedingte Gefrierpunktniedrigung]** Kuhn, W., *Helvetica chimica acta*, 1956, 39(4), p.1071-1086, In German. Refs. passim.  
Polymers, Frozen liquids, Solidification, Phase transformations, Solid phases, Freezing points, Crystal growth

## 53-4036

**On the temperature or concentration fields produced inside an infinite or finite domain by moving surfaces at which the temperature or concentration are given as functions of time.** Grinberg, G.A., *Journal of applied mathematics and mechanics*, Dec. 1969(Pub. June 70), 33(6), p.1021-1029, Translated from Prikladnaia matematika i mekhanika, Vol.33, No.6, Dec. 1969, p.1051-1060. 8 refs.  
Heat transfer, Conduction, Phase transformations, Liquid phases, Thawing rate, Mathematical models

## 53-4037

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Snow surveys, Runoff forecasting, Snow depth, Snow water equivalent, Stream flow, Canada—Yukon Territory

## 53-4038

**Physics of englacial and subglacial meltwater drainage—theory and observations.** Röthlisberger, H., *Universität Salzburg. Institut für Geographie. Salzburger geographische Materialien*, 1998, Vol.28, International Symposium on Glacier Caves and Cryokarst in Polar and High Mountain Regions, Rudolfschütte, Salzburg, Austria, Sep. 1-7, 1996, p.13-23, 22 refs.  
Glacial hydrology, Subglacial caves, Subglacial drainage, Meltwater, Water pressure, Water flow, Water erosion

## 53-4039

**Field sampling and selecting on-site analytical methods for explosives in water.** Crockett, A.B., Craig, H.D., Jenkins, T.F., MP 5339, *U.S. Environmental Protection Agency. Office of Research and Development. Office of Solid Waste and Emergency Response. Federal Facilities Forum. Issue paper*, May 19, 1999, EPA/600/S-99/002, 48p., Refs. p.41-48.  
Military facilities, Site surveys, Explosives, Waste disposal, Water pollution, Soil pollution, Wells, Ground water, Hydrogeochemistry, Water chemistry, Chemical analysis

## 53-4040

**Using infrared thermography for condition assessment of buried district heating piping systems.** Phetteplace, G., MP 5340, International Symposium on District Heating and Cooling, 7th, Lund, Sweden, May 18-20, 1999. Proceedings, 1999, p.1-11, 13 refs.  
Utilities, Heating, Heat transmission, Heat pipes, Heat loss, Underground pipelines, Soil temperature, Infrared photography  
Infrared thermography has been used successfully for many years to find problem areas on buried district heating systems. While such information is useful for locating areas of major failures, for planning purposes some quantification of the results from an infrared survey of major portions of a district heating system would be advantageous. Some recent progress has been made toward this end by two International Energy Agency District Heating projects in which the US Army Cold Regions Research and Engineering Laboratory (CRREL) has participated with colleagues from the Nordic countries. The objective of these projects was to develop a method that would allow quantification of heat losses from the temperature

profile of the ground's surface above the buried heat distribution pipeline. Basically, the method uses the integral of the temperature distribution at the ground's surface along with climatological and system data to arrive at an empirical estimate of the heat loss. Using this method, CRREL has conducted infrared surveys of two facilities. Results have been good, and the facilities have been provided with both heat loss estimates and prioritized replacement lists. This paper describes the "TX method," as it is called, and its use. Sample results from the surveys done to date will also be presented.

### 53-4041

#### Problems with surface layer similarity theory in the Arctic.

Guest, P.S., Andreas, E.L., Fairall, C.W., Persson, P.O.G., MP 5341, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.132-135.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric boundary layer, Air ice water interaction, Ice heat flux, Turbulent exchange, Cloud cover, Heat balance

### 53-4042

#### Observations of large thermal transitions during the arctic night from a suite of sensors at SHEBA.

Persson, P.O.G., Uttal, T., Intrieri, J., Fairall, C.W., Andreas, E.L., Guest, P.S., MP 5342, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.306-309, 8 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Drift stations, Cloud cover, Air ice water interaction, Snow ice interface, Snow heat flux, Ice heat flux, Heat balance

### 53-4043

#### Intercomparison of downward longwave flux measurements during the first two months of SHEBA.

Russell, C.A., et al, MP 5343, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.314-318, 2 refs.

Drift stations, Polar atmospheres, Radiation balance, Infrared radiation, Radiation measurement, Radiation measuring instruments, Radomes, Ice removal, Defrosting

### 53-4044

#### Surface energy budget during the onset of the melt season on the arctic icepack during SHEBA.

Persson, P.O.G., Andreas, E.L., Fairall, C.W., Guest, P.S., Ruffieux, D.R., MP 5344, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.321-326, 15 refs.

Polar atmospheres, Air ice water interaction, Snow ice interface, Ice heat flux, Ice melting, Ice breakup, Radiation balance

### 53-4045

#### Surface energy budget and atmospheric effects of a freezing lead at SHEBA.

Pinto, J.O., et al, MP 5345, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.397-400, 5 refs.

Polar atmospheres, Air ice water interaction, Snow ice interface, Albedo, Ice heat flux, Ice openings, Sea water freezing, Heat balance

### 53-4046

#### Surface temperature measurements at SHEBA.

Claffey, K.J., Andreas, E.L., Perovich, D.K., Fairall, C.W., Guest, P.S., Persson, P.O.G., MP 5346, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.327-332, 4 refs.

Polar atmospheres, Air temperature, Surface temperature, Snow ice interface, Snow surface temperature, Ice heat flux, Temperature measurement, Thermistors, Hygrometers, Radiation measuring instruments

### 53-4047

#### Role of surface-layer turbulent interactions in the longwave flux/surface temperature feedback during SHEBA.

Fairall, C.W., Persson, P.O.G., Andreas, E.L., Guest, P.S., MP 5347, Conference on Polar Meteorology and Oceanography, 5th, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.421-424, 2 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric boundary layer, Air ice water interaction, Cloud cover, Albedo, Ice heat flux, Turbulent exchange, Heat balance

### 53-4048

#### Effects of sea spray on tropical cyclone intensity.

Andreas, E.L., Emanuel, K.A., MP 5348, Conference on Hurricanes and Tropical Meteorology, 23rd, Dallas, TX, Jan. 10-15, 1999. Preprint volume, Boston, American Meteorological Society, 1999, p.22-25, 21 refs.

Marine atmospheres, Atmospheric circulation, Air water interactions, Sea spray, Evaporation, Heat transfer, Moisture transfer, Turbulent exchange, Atmospheric disturbances, Storms

### 53-4049

#### Effect of turbulence on fluidelastic instability in tube bundles: a nonlinear analysis.

Rzentskowski, G., Lever, J.H., MP 5349, *Journal of fluids and structures*, July 1998, 12(5), p.561-590, 25 refs.

Pipes (tubes), Heat pipes, Pipe flow, Turbulent flow, Fluid flow, Fluid dynamics, Mathematical models

This paper is concerned with the behavior of a tube bundle subjected to combined fluidelastic and turbulence excitation. Here, the authors formulate the fluidelastic forces based on a simplified, nonlinear model for a single flexible tube surrounded by rigid neighbors and constrained to move transverse to the mean flow. They use a flat power spectral density function to express the turbulence excitation. The resulting system they first examine heuristically, based on a superposition of both excitation mechanisms. They then assess the merits of this approach via direct numerical integration of the equation of motion. Lastly, they perform a nonlinear investigation into the sensitivity of the fluidelastic stability boundary on variations in the random field of turbulence and generate a stability map. The analysis shows that the fluidelastic stability boundary defined by an unstable bifurcation may be reduced by turbulence; for long-term operation, the threshold reduction may approach the size of a hysteresis region. This effect increases with turbulence intensity and decreases with unstable-limit-cycle amplitude. For a stable bifurcation, the fluidelastic stability boundary is virtually unaffected by turbulence. In the latter case, the effect of turbulence is through practical stability definitions made using amplitude-response curves.

### 53-4050

#### Laboratory tests of a time-domain reflectometry system for frazil ice detection.

Yankielun, N.E., Gagnon, J.J., MP 5350, *Canadian journal of civil engineering*, Apr. 1999, 26(2), p.168-176, With French summary. 18 refs.

Water intakes, Frazil ice, Ice accretion, Ice loads, Icing rate, Ice electrical properties, Ice dielectrics, Ice detection, Monitors, Telemetering equipment

A prototype, electromagnetic-based frazil ice detection system (patent pending) has been developed and tested under simulated frazil ice accretion conditions in an environmentally controlled flume. The system employs a time-domain reflectometer (TDR) and specially designed transmission line sensor to monitor the accretion of frazil ice by measuring the propagation time along the sensor when it is submerged. Changes in the round-trip travel time of the TDR pulse result from a decrease in the localized bulk dielectric constant as frazil ice accretes and displaces water around the sensor. Two frazil detection sensor configurations were tested, a parallel transmission line probe and a semicylindrical mesh coaxial probe. During 2 h long experiments, the TDR clearly indicated a decreasing probe propagation time as frazil ice continued to accrete. This is indicative of the decreasing bulk dielectric constant of the frazil ice and water mix. Continuous real-time data from the TDR were recorded. From these data, an estimate of volumetric ice fraction was calculated using a simple linear dielectric mixing equation. Volumetric ice fractions estimates for both probe configurations were calculated to increase from approximately 0.02 to 0.18 during the test. The system shows promise for detection and measurement of frazil ice growth and accretion in freshwater bodies.

### 53-4051

#### Hydrology in a changing environment.

Wheater, H., ed, Kirby, C., ed, British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1, Chichester, UK, John Wiley & Sons, Ltd., 1998, 592p., Refs. passim. For selected papers see 53-4052 through 53-4058.

DLC GB652.B75 1998 Vol.1

Hydrologic cycle, Watersheds, Models, Snowmelt, Runoff

### 53-4052

#### Adaptation of TOPMODEL to snow and glacier melt data on a French alpine catchment: first results.

Durot, K., Saulnier, G.M., Obled, C., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheater and C. Kirby and Theme 1: Global hydrological processes, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.21-31, 15 refs.

DLC GB652.B75 1998 Vol.1

Flood forecasting, Snowmelt, Models, Computerized simulation, Runoff forecasting, Watersheds, France—Alps

### 53-4053

#### Integrating atmospheric and vegetation succession data in a macroscale hydrological model.

Kite, G., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheater and C. Kirby and Theme 1: Global hydrological processes, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.43-52, 29 refs.

DLC GB652.B75 1998 Vol.1

Hydrologic cycle, Models, Watersheds, Vegetation factors, Stream flow, Ground water, Snow cover effect, Runoff, Canada

### 53-4054

#### Parameterization of cryologic processes for large-scale atmospheric models.

Shmakin, A.B., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheater and C. Kirby and Theme 1: Global hydrological processes, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.117-124, 16 refs.

DLC GB652.B75 1998 Vol.1

Snow cover, Albedo, Mathematical models, Heat flux, Snow melting, Frozen ground, Soil freezing, Climate, Russia

### 53-4055

#### Effects of global warming on runoff in mountain basins representing different climate zones.

Rango, A., Martinec, J., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheater and C. Kirby and Theme 1: Global hydrological processes, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.133-139, 8 refs.

DLC GB652.B75 1998 Vol.1

Global warming, Snowmelt, Runoff, Snow accumulation, River basins, Climatic changes, Snow water equivalent, Climatic factors, North America

### 53-4056

#### Long-term fluctuation of glacier runoff in Central Asia.

Konovalov, V., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheater and C. Kirby and Theme 1: Global hydrological processes, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.141-146, 3 refs.

DLC GB652.B75 1998 Vol.1

Mountain glaciers, Glacier mass balance, Runoff, Glacier melting, Glacier oscillation, Glacier ablation, Glacial rivers, CIS—Central Asia, Pamirs

53-4057

**Classification of rivers to assess low flow impacts on water quality.**

Vladimirov, A.M., Lobanova, H.V., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheeler and C. Kirby and Theme 2: Ecological and hydrological interactions, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.329-334, 5 refs.

DLC GB652.B75 1998 Vol.1

Rivers, Water pollution, River flow, Classifications, Freezeup, Runoff, Water level, Russia

53-4058

**Long-term effects of forest mosaic management on storm and snowmelt flow, Quebec.**

Plamondon, A.P., Lévesque, D., Ma, Y., Prévost, M., British Hydrological Society International Conference, Exeter, UK, July 1998. Proceedings, Vol.1. Hydrology in a changing environment. Edited by H. Wheeler and C. Kirby and Theme 2: Ecological and hydrological interactions, Chichester, UK, John Wiley & Sons, Ltd., 1998, p.503-515, 47 refs.

DLC GB652.B75 1998 Vol.1

Forestry, Snowmelt, Rain, Hydrography, Canada—Quebec

53-4059

**Glacier Bay, Alaska, from the ground, air and space.**

Hall, D.K., Greenbelt, MD, NASA, 1996, n.p., 13-minute VHS videotape.

Glacier oscillation, Glacier surveys, Remote sensing, Spaceborne photography, Vegetation patterns, Climatology, Education, United States—Alaska—Glacier Bay

53-4060

**Snow and snow avalanches.**

Anisimov, M.I., U.S. Forest Service. *Wasatch National Forest. Alta Avalanche Study Center. Translation*, Apr. 1963, No.1, 64p., For Russian original see 14-17288.

Avalanche mechanics, Avalanche formation, Avalanche protection, Avalanche forecasting, Countermeasures, Avalanche wind, Snow cover, Snow density, Snow crust, Snowdrifts, Snow recrystallization, Snow cover stability, Snow slides, Russia—Kirovsk, Russia—Khibiny Mountains

53-4061

Evolutionary geocryological processes in the arctic regions and problems of global changes of the environment and climate in permafrost areas; Abstracts of papers from the anniversary annual meeting, April 24-28, 1995. [Evolutsionnye geokriologicheskie protsessy v arkticheskikh regionakh i problemy global'nykh izmenenii' prirodnof sredy i klimata na territorii kriolitozony; Tezisy dokladov IUbileynogo godichnogo sobraniya 24-28 aprilya 1995 g.]

Russian Academy of Sciences. Scientific Council on Earth Cryology, Pushchino, Russian Academy of Sciences, 1995, 157p., 114 abstracts. In Russian with English titles; some with full text in Russian and English.

Geocryology, Global change, Climatic changes, Global warming, Pleistocene, Paleoclimatology, Climatic factors, Hydrates, Alasay, Tundra, Ecosystems, Hydrocarbons, Carbon dioxide, Permafrost beneath roads, Permafrost beneath structures, Engineering geology, Frozen ground, Russia

53-4062

**Paleoclimatology; reconstructing climates of the Quaternary; Second edition.**

Bradley, R.S., International geophysics series, Vol.68, San Diego, CA, Harcourt Academic Press, 1999, 613p., Refs. p.513-594. For first edition see 39-2885.

Paleoclimatology, Climate, Climatic changes, Ice cores, Radioactive age determination, Geomagnetism, Age determination, Isotope analysis, Oxygen isotopes, Marine deposits, Bottom sediment, Ocean currents, Pollen, Palynology, Models, Loess, Periglacial processes, Mountain glaciers, Glacier oscillation, Glaciation, Lakes, Water level, Fossils, Atmospheric circulation, Antarctica, Greenland, Africa, Europe, Colombia, United States—Florida, Amazonia

53-4063

**Under ice; Waldo Lyon and the development of the arctic submarine.**

Leary, W.M., Texas A & M University military history series, Vol.62, College Station, TX, Texas A & M University Press, 1999, 303p., Refs. p.287-291. DLC V857.S.L43 1999

Military operation, Submarines, Icebreakers, Ice navigation, History, Military research, Subglacial navigation

53-4064

**New generation ramsonde having multiple sensors.**

Abe, O., Japan. *National Research Institute for Earth Science and Disaster Prevention. Report*, Mar. 1999, No.59, p.11-18, With Japanese summary. 15 refs.

Snow survey tools, Snow cover stability, Snow strength, Snow stratigraphy, Snow electrical properties, Snow density, Snow water content, Avalanche forecasting

53-4065

**Study on the dynamics of an artificial avalanche in the Tianshan Mountains, China. [Chugoku Tensan sanmyaku ni okeru jinko nadare no dorigakuteki kenkyu]**

Abe, O., et al, Japan. *National Research Institute for Earth Science and Disaster Prevention. Report*, Mar. 1999, No.59, p.19-30, In Japanese with English summary. 21 refs.

Avalanche triggering, Avalanche modeling, Avalanche mechanics, Avalanche deposits, Snow loads, Impact tests, China—Tian Shan

53-4066

**Ground disaster caused by the Kushiro-oki earthquake on 15 January 1993. [1993-nen ichigatsu no Kushiro-oki jishin ni yotte shojita jiban saigai to sono tokuchou]**

Inokuchi, T., Japan. *National Research Institute for Earth Science and Disaster Prevention. Report*, Mar. 1999, No.59, p.31-56, In Japanese with English summary. 20 refs.

Earthquakes, Landslides, Accidents, Slope stability, Frozen ground strength, Japan—Hokkaido

53-4067

**Multiple linear regression for lake ice and lake temperature characteristics.**

Gao, S.B., Stefan, H.G., *Journal of cold regions engineering*, June 1999, 13(2), p.59-77, 16 refs.

Lake ice, Lake water, Water temperature, Ice water interface, Freezeup, Ice conditions, Ice cover thickness, Ice breakup, Ice forecasting, Statistical analysis, Mathematical models

53-4068

**Numerical study of ice jam dynamics in upper Niagara River.**

Lu, S.N., Shen, H.T., Crissman, R.D., *Journal of cold regions engineering*, June 1999, 13(2), p.78-102, 15 refs.

River ice, Ice jams, Ice water interface, Ice cover effect, Ice friction, River flow, Ice forecasting, Flood forecasting, Mathematical models, Niagara River

53-4069

**Underground leakage into freezing ground.**

Han, S.J., Goodings, D.J., Torrents, A., Zeinali, M., *Journal of cold regions engineering*, June 1999, 13(2), p.103-112, 10 refs.

Underground storage, Waste disposal, Leakage, Soil pollution, Soil freezing, Frozen ground chemistry, Soil water migration

53-4070

**Calcium magnesium acetate at lower-production cost: production of CMA delcer from cheese whey.**

Yang, S.T., Huang, Y.L., Jin, Z.W., Huang, Y., Zhu, H., Qin, W., U.S. Federal Highway Administration. *Research, Development, and Technology Turner-Fairbank Highway Research Center, McLean, VA. Report*, Apr. 1999, FHWA-RD-98-174, 108p., PB99-148991, Refs. p.101-108.

Road icing, Chemical ice prevention, Biomass, Waste disposal, Microbiology, Bacteria, Fungi, Road maintenance, Cost analysis

53-4071

**Hydrologic data for the Matanuska River watershed, southcentral Alaska.**

Maurer, M.A., Alaska Department of Natural Resources. *Division of Geological and Geophysical Surveys. Public-data file*, July 1998, No.98-41, 14p., 6 refs.

Glacial rivers, Watersheds, Drainage, Stream flow, Water reserves, Water chemistry, Hydrogeochemistry, United States—Alaska—Matanuska River

53-4072

**Survey of nonglycol and reduced glycol aircraft deicing methods.**

Cornish, J., Eyre, F., U.S. Federal Aviation Administration. *Office of Aviation Research, Washington, D.C. Report*, Apr. 1999, DOT/FAA/AR-99/18, 36p. + appends., 3 refs.

Aircraft icing, Ice removal, Snow removal, Chemical ice prevention, Defrosting, Artificial melting

53-4073

**Frost dynamics in high alpine rock walls with the Jungfrauoch-Aletsch region as an example. [Frostdynamik in hochalpinen Felswänden am Beispiel der Region Jungfrauoch-Aletsch]**

Wegmann, M., Zürich. *Eidgenössische Technische Hochschule. Versuchsanstalt für Wasserbau, Hydrologie und Glaziologie. Mitteilungen*, 1998, No.161, 144p., In German with English summary. Refs. p.129-141.

Permafrost samplers, Permafrost heat transfer, Frozen rock strength, Frozen ground thermodynamics, Frost action, Frost shattering, Periglacial processes, Switzerland

53-4074

**Dimensions and topographic setting of antarctic subglacial lakes and implications for large-scale water storage beneath continental ice sheets.**

Dowdeswell, J.A., Siegert, M.J., *Geological Society of America. Bulletin*, Feb. 1999, 111(2), p.254-263, 26 refs.

Ice sheets, Glacier beds, Glacial hydrology, Subglacial drainage, Glacial lakes, Subglacial observations, Bottom topography, Water storage, Radio echo soundings, Antarctica—East Antarctica

53-4075

**Importance of mechanical disaggregation in chemical weathering in a cold alpine environment, San Juan Mountains, Colorado.**

Hoch, A.R., Reddy, M.M., Drever, J.I., *Geological Society of America. Bulletin*, Feb. 1999, 111(2), p.304-314, 49 refs.

Mountain soils, Weathering, Frozen ground chemistry, Snowmelt, Seepage, Soil chemistry, Mineralogy, Geochemical cycles, United States—Colorado—San Juan Mountains

53-4076

Synoptic classification of severe snowstorms over Austria.  
Spreitzhofer, G., *Meteorologische Zeitschrift*, Feb. 1999, 8(1), p.3-15, With German summary. 24 refs. Snowstorms, Snowfall, Atmospheric circulation, Atmospheric disturbances, Synoptic meteorology, Weather forecasting, Austria

53-4077

Climate changes indicated by trends in snow cover duration and surface albedo in Estonia.  
Tooming, H., Kadaja, J., *Meteorologische Zeitschrift*, Feb. 1999, 8(1), p.16-21, With German summary. 6 refs. Snow cover distribution, Snow air interface, Snow cover effect, Snow heat flux, Albedo, Climatic changes, Estonia

53-4078

Paraglacial and postglacial debris flows on a Little Ice Age terminal moraine: Jamapa Glacier, Pico de Orizaba (Mexico).  
Palacios, D., Parrilla, G., Zamorano, J.J., *Geomorphology*, May 1999, 28(1-2), p.95-118, 48 refs. Volcanoes, Mountain glaciers, Glacial geology, Glacier oscillation, Glacial deposits, Moraines, Outwash, Mudflows, Mass movements (geology), Permafrost indicators, Periglacial processes, Lichens, Soil dating, Paleoclimatology, Mexico—Pico de Orizaba

53-4079

Deicing agents and anti-icing agents for aircraft. [Enteisungsmittel bzw. Vereisungsschutzmittel für Flugzeuge]  
Schrumpf, H., Krebs, H., Liebold, G., Frey, G., *European Patent Office. Patent*, Mar. 23, 1990, 8p., EP 0 360 183 A2. Chemical ice prevention, Ice removal, Aircraft icing, Cold weather performance

53-4080

Pneumatic vehicle tires. [Pneumatischer Fahrzeugreifen]  
Hausmann, B., *European Patent Office. Patent*, Jan. 20, 1993, 7p., EP 0 524 164 A1. Tires, Traction, Cold weather performance, Chemical composition, Rubber snow friction, Rubber ice friction, Skid resistance

53-4081

Spiral wire rope anchor, particularly for anchoring rock slide and avalanche protection systems. [Spiraldrachseilanker, insbesondere zur Verankerung von Steinschlag- und Lawinenschutzsystemen]  
Popp, X., Loepfe, T., *European Patent Office. Patent*, Aug. 25, 1993, 5p., EP 0 557 241 A1. Anchors, Avalanche protection, Countermeasures, Equipment, Design

53-4082

Behaviour of groundwater in the slope failure area of the Gamahara torrent. [Gamahara-zawa gentobu hokaichi fukin no chikasu ni kyodo ni tsuite]  
Marui, H., Watanabe, N., Satou, K., Yoshikawa, M., Nagumo, M., Toyama, Y., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.1-9, In Japanese with English summary. 7 refs. Snowmelt, Ground water, Water table, Slope stability, Slope processes, Mudflows, Japan

53-4083

1997 Hachimantai debris flow and the geological, geotechnical and geochemical backgrounds. [1997-nen Hachimantai doseikiryu to chishitsu, doshitsu oyobi ni suishitsu]  
Marui, H., Watanabe, N., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.10-24, In Japanese with English summary. 11 refs. Mudflows, Landslides, Snowmelt, Ground water, Water chemistry, Hydrogeology, Hydrogeochemistry, Slope stability, Japan

53-4084

Hazard mapping method for dangerous torrent threatened by debris flow—on the basis of discussion at the international workshop on hazard mapping in Salzburg, Austria. [Doseikiryu kiken keiryu ni okeru kiken kuiki settei shuho ni tsuite—Osutoria de no kokusai wakushoppu no giron chushin toshite]  
Marui, H., Kaibori, M., Kimura, M., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.25-36, In Japanese with English summary. 5 refs. Meetings, Mudflows, Landslides, Floods, Avalanches, Flood forecasting, Avalanche forecasting, Mapping, Austria

53-4085

Landslide investigation and prevention practice in Nepal.  
Tiwari, B., Marui, H., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.37-55, 16 refs. Landslides, Mudflows, Floods, Slope stability, Flood forecasting, Landslide control, Flood control, Nepal

53-4086

Analysis of spatial characteristics for groundwater flow in Okimi landslide area. [Okimi tsuchi suberi ryuiki ni okeru chikasu ryushutsu tokusei no kaiseiki]  
Luo, X.L., Marui, H., Sato, O., Watanabe, N., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.62-80, In Japanese with English summary. 19 refs. Snowmelt, Runoff forecasting, Ground water, Water flow, Landslides, Mudflows, Flood forecasting, Japan

53-4087

Analysis of pH value of soils affected by acid snow and rain. [Sansai-setsu, -u ni yoru dojo no pH bunpu no kento]  
Yamamoto, M., Taguchi, Y., Aoyama, K., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.111-116, In Japanese. 12 refs. Air pollution, Precipitation (meteorology), Snowfall, Scavenging, Snow composition, Snow impurities, Soil pollution, Soil chemistry, Soil tests, Japan

53-4088

Overview of the issues on earthquake disaster mitigation in snow season considering with public consensus on disaster prevention. [Junin no bosai ishiki o koryo shita sekisetsuki jishin no sogoteki na bosai taisaku no ikkosatsu]  
Kimura, T., Aoyama, K., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.117-128, In Japanese. 44 refs. Earthquakes, Snow cover effect, Cold weather operation, Rescue operations, Regional planning, Japan

53-4089

Result of the questionnaire survey on the countermeasures for earthquake disaster mitigation in snow season. [Jishin bosai ni kansuru anketo chosa shukei kekka]  
Kimura, T., Aoyama, K., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.129-136, In Japanese. Earthquakes, Snow cover effect, Cold weather operation, Rescue operations, Regional planning, Japan

53-4090

Structure of the ice pillar in the cold room. [Teionshitsu ni dekita hyochu no kesho kozo]  
Takeuchi, Y., Maeda, N., Nagasaki, T., Yamada, H., Wang, X., Sato, M., *Niigata University. Research Institute for Hazards in Snowy Areas. Annual report*, 1998 (Pub. 1999), No.20, p.137-142, In Japanese with English summary. 3 refs. Cold chambers, Artificial ice, Icicles, Ice structure, Ice growth, Ice crystal structure

53-4091

Satellite image atlas of glaciers of the world. *Glaciers of South America*.  
Williams, R.S., Jr., ed, Ferrigno, J.G., ed, *U.S. Geological Survey. Professional paper*, 1998, No.1386-I, 206p., Refs. passim. For individual papers see 53-4092 through 53-4097. Glacier surveys, Mountain glaciers, Alpine glaciation, Cirque glaciers, Volcanoes, Glacier oscillation, Glacial meteorology, Glacier mass balance, Glacier melting, Snow line, Aerial surveys, Mapping, Spaceborne photography, South America

53-4092

*Glaciers of Venezuela*.  
Schubert, C., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-1, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.11-110, 21 refs. Glacier surveys, Mountain glaciers, Cirque glaciers, Glacier oscillation, Alpine glaciation, Glacier melting, Mapping, Spaceborne photography, Venezuela

53-4093

*Glaciers of Colombia*.  
Hoyos-Patiño, F., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-2, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.111-130, 55 refs. Glacier surveys, Mountain glaciers, Volcanoes, Alpine glaciation, Glacier oscillation, Glacier melting, Moraines, Snow line, Aerial surveys, Mapping, Spaceborne photography, Colombia

53-4094

*Glaciers of Ecuador*.  
Jordan, E., Hastenrath, S.L., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-3, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.131-150, 22 refs. Glacier surveys, Mountain glaciers, Alpine glaciation, Volcanoes, Glacier oscillation, Glacier mass balance, Glacier melting, Snow line, Aerial surveys, Mapping, Spaceborne photography, Ecuador

53-4095

*Glaciers of Peru*.  
Morales Arnao, B., Hastenrath, S.L., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-4, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.151-179, 76 refs. Includes "Cordillera Blanca on LANDSAT imagery" and "Quelccaya Ice Cap" by S.L. Hastenrath. Glacier surveys, Mountain glaciers, Alpine glaciation, Glacier oscillation, Glacial meteorology, Glacier mass balance, Glacial lakes, Lake bursts, Floods, Avalanches, Mudflows, Flood control, Aerial surveys, Mapping, Spaceborne photography, Peru

53-4096

*Glaciers of Bolivia*.  
Jordan, E., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-5, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.181-1108, 34 refs. Glacier surveys, Mountain glaciers, Alpine glaciation, Glacier oscillation, Glacial meteorology, Glacier mass balance, Snow line, Aerial surveys, Mapping, Spaceborne photography, Bolivia

53-4097

*Glaciers of Chile and Argentina*.  
Lliboutry, L., Corte, A.E., *U.S. Geological Survey. Professional paper*, 1998, No.1386-I-6, Satellite image atlas of glaciers of the world. *Glaciers of South America*. Edited by R.S. Williams, Jr., and J.G. Ferrigno, p.1109-1206, 106 refs. Includes "Rock glaciers" by A.E. Corte, with 52 refs. Glacier surveys, Mountain glaciers, Alpine glaciation, Cirque glaciers, Volcanoes, Rock glaciers, Glacier oscillation, Glacial meteorology, Glacier mass balance, Glacier surges, Snow line, Paleoclimatology, Aerial surveys, Mapping, Spaceborne photography, Chile, Argentina

## 53-4098

**Response of West Pacific marginal seas to global climate change.**

Sarnthein, M., ed, Wang, P.X., ed, *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue, 308p., Refs. passim. For individual papers see 53-4099 through 53-4111.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Drill core analysis, Atmospheric circulation, Ocean currents, Air water interactions, Sea level, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4099

**Preface: Response of West Pacific marginal seas to global climatic change.**

Sarnthein, M., Wang, P.X., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.1-3, 5 refs.

Marine geology, Sea level, Ocean currents, Atmospheric circulation, Paleoclimatology, Global change, South China Sea

## 53-4100

**Response of Western Pacific marginal seas to glacial cycles: paleoceanographic and sedimentological features.**

Wang, P.X., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.5-39, Refs. p.35-39.

Glaciation, Glacial meteorology, Marine geology, Marine atmospheres, Atmospheric circulation, Air water interactions, Ocean currents, Marine deposits, Quaternary deposits, Bottom sediment, Drill core analysis, Geochemical cycles, Global change, Paleoclimatology, South China Sea

## 53-4101

**Modern distribution patterns of planktonic foraminifera in the South China Sea and western Pacific: a new transfer technique to estimate regional sea-surface temperatures.**

Pflaumann, U., Jian, Z.M., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.41-83, 76 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Atmospheric circulation, Ocean currents, Sea level, Water temperature, Surface temperature, Drill core analysis, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4102

**Late Quaternary planktonic foraminifer faunal record of rapid climatic changes from the South China Sea.**

Chen, M.T., Wang, C.H., Huang, C.Y., Wang, P.X., Wang, L.J., Sarnthein, M., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.85-108, 56 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Quaternary deposits, Drill core analysis, Atmospheric circulation, Ocean currents, Air water interactions, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4103

**Molecular biomarker record of sea surface temperature and climatic change in the South China Sea during the last 140,000 years.**

Pelejero, C., Grimalt, J.O., Sarnthein, M., Wang, L.J., Flores, J.A., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.109-121, 47 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Sea level, Atmospheric circulation, Ocean currents, Water temperature, Surface temperature, Drill core analysis, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4104

**Quantitative composition of benthic foraminiferal assemblages as a proxy indicator for organic carbon flux rates in the South China Sea.**

Kuhnt, W., Hess, S., Jian, Z.M., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.123-157, 46 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Drill core analysis, Nutrient cycle, Geochemical cycles, Biomass, Air water interactions, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4105

**Benthic foraminiferal paleoceanography of the South China Sea over the last 40,000 years.**

Jian, Z.M., et al, *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.159-186, 75 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Drill core analysis, Paleocology, Biomass, Nutrient cycle, Geochemical cycles, Global change, Paleoclimatology, South China Sea

## 53-4106

**Allochthonous ostracods in the South China Sea and their significance in indicating downslope sediment contamination.**

Zhou, B.C., Zhao, Q.H., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.187-195, 34 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Sediment transport, Drill core analysis, Biomass, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4107

**Late Pleistocene nutrients and sea surface productivity in the South China Sea: a record of teleconnections with northern hemisphere events.**

Lin, H.L., Lai, C.T., Ting, H.C., Wang, L.J., Sarnthein, M., Hung, J.J., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.197-210, 53 refs.

Marine geology, Marine biology, Marine atmospheres, Glacial meteorology, Atmospheric circulation, Air water interactions, Marine deposits, Bottom sediment, Drill core analysis, Biomass, Nutrient cycle, Geochemical cycles, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4108

**Pollen distribution in hemipelagic surface sediments of the South China Sea and its relation to modern vegetation distribution.**

Sun, X.J., Li, X., Beug, H.J., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.211-226, 31 refs.

Marine geology, Marine deposits, Bottom sediment, Sediment transport, Atmospheric circulation, Ocean currents, Palynology, Vegetation patterns, Plant ecology, Paleobotany, Global change, Paleoclimatology, South China Sea

## 53-4109

**Pollen record of the last 37 ka in deep sea core 17940 from the northern slope of the South China Sea.**

Sun, X.J., Li, X., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.227-244, 34 refs.

Marine geology, Marine deposits, Bottom sediment, Atmospheric circulation, Drill core analysis, Palynology, Vegetation patterns, Plant ecology, Paleobotany, Global change, Paleoclimatology, South China Sea

## 53-4110

**East Asian monsoon climate during the Late Pleistocene: high-resolution sediment records from the South China Sea.**

Wang, L.J., et al, *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.245-284, Refs. p.279-284.

Marine geology, Marine deposits, Bottom sediment, Marine atmospheres, Atmospheric circulation, Ocean currents, Air water interactions, Sea level, Drill core analysis, Paleocology, Global change, Paleoclimatology, South China Sea

## 53-4111

**Surface-water evolution of the eastern East China Sea during the last 36,000 years.**

Xu, X.D., Oda, M., *Marine geology*, Mar. 15, 1999, 156(1-4), International Geological Congress, 30th, Beijing, China, Aug. 8-9, 1996. Selected papers. Special issue: Response of West Pacific marginal seas to global climate change. Edited by M. Sarnthein and P.X. Wang, p.285-304, 45 refs.

Marine geology, Marine biology, Marine deposits, Bottom sediment, Drill core analysis, Ocean currents, Water temperature, Salinity, Paleocology, Global change, Paleoclimatology, East China Sea

## 53-4112

**Procedure and set-up for preparation of winter grit. [Verfahren und Anlage zur Aufbereitung von für den Winterdienst eingesetztem Streugut]**

Peier, U., Gloor, R., Axt, W., Weber, H., *European Patent Office. Patent*, Jan. 25, 1989, 5p. + fig., EP 0 300 297 A1, In German.

Sanding, Road maintenance, Traction, Skid resistance, Winter maintenance, Design, Equipment

## 53-4113

**Procedures for steering road vehicles with front- and rear-wheel steering. [Verfahren zum Lenken eines Strassenfahrzeugs mit Vorder- und Hinteradlenkung]**

Ackermann, J., *European Patent Office. Patent*, Mar. 11, 1992, 18p., EP 0 474 130 A2.

Mathematical models, Motor vehicles, Cold weather performance, Data processing, Skid resistance, Computer applications

53-4114

International Arctic Buoy Program data report, 1 January 1994-31 December 1994.

Rigor, I.G., Heiberg, A., *University of Washington, Seattle. Applied Physics Laboratory. Technical memorandum*, Dec. 1995, APL-UW-TM6-95, 200p. + appends., ADA-304 423.

Drift stations, Polar atmospheres, Marine meteorology, Air water interactions, Sea ice distribution, Ice reporting, Drift, Ocean currents, Atmospheric pressure, Air temperature, Surface temperature, Meteorological data, Data processing, Data transmission, Arctic Ocean

53-4115

EPOCA-95 cruise report.

King, S.E., Carroll, J., Johnson, D.R., *U.S. Naval Research Laboratory. Memorandum report*, Feb. 13, 1996, NRL/MR/6616-96-7813, 51p., ADA-305 375. Oceanographic surveys, Ocean currents, Water transport, Radioactive wastes, Waste disposal, Water pollution, Russia—Kara Sea, Arctic Ocean

53-4116

1993-94-95 Kara Sea field experiments and analysis. 1995 progress report to ONR Arctic Nuclear Waste Assessment Program.

Phillips, G.W., et al, *U.S. Naval Research Laboratory. Memorandum report*, Jan. 14, 1996, NRL/MR/6616-96-7811, 91p., ADA-305 284, 7 refs.

Radioactive wastes, Waste disposal, Water pollution, Ocean currents, Sediment transport, Alluvium, Suspended sediments, Bottom sediment, Russia—Kara Sea, Russia—Siberia, Arctic Ocean

53-4117

Variations of ice cover and thermohaline structure in the Arctic-GIN Sea basin. Analysis of model results for the 1986-1990 period.

Allard, R.A., Piacsek, S.A., *U.S. Naval Research Laboratory. Memorandum report*, Jan. 26, 1996, NRL/MR/7322-95-7684, 39p., ADA-304 887, 21 refs.

Sea ice distribution, Ice conditions, Ice edge, Drift, Air ice water interaction, Ice water interface, Ice heat flux, Heat balance, Atmospheric circulation, Ocean currents, Water temperature, Salinity, Ice models, Computerized simulation, Arctic Ocean, Barents Sea, Greenland Sea, Norwegian Sea

53-4118

Distribution of the radiation balance components on variously oriented and sloped surfaces in the Transylvanian plain.

Fărcaș, I., Mocrei, I., *Revue roumaine de géographie*, 1997, No.41, p.107-110 + map, With French summary. 7 refs.

DLC GB276.R8R4 T.41 1997

Radiation balance, Slopes, Slope orientation, Albedo, Solar radiation, Brightness, Snow cover effect, Romania

53-4119

Thermal regime tendencies of winters in Bucharest—a climate variability index.

Tuinea, P., Becheanu, V., Săraur, L., *Revue roumaine de géographie*, 1997, No.41, p.111-119, With French summary. 6 refs.

DLC GB276.R8R4 T.41 1997

Thermal regime, Climatic changes, Snow cover effect, Climate, Air temperature, Romania—Bucharest

53-4120

How similar are snow-cover patterns from year to year? [Wie ähnlich sind Ausaperungsmuster von Jahr zu Jahr?]

Kirnbauer, R., Blöschl, G., *Deutsche gewässerkundliche Mitteilungen*, Dec. 1993, 37(5/6), p.113-121, In German with English summary. 20 refs.

DLC GB651.D4 Vols.37-38 1993-94

Snow cover distribution, Ablation, Slope orientation, Altitude, Topographic effects, Snow water equivalent, Watersheds, Austria—Alps

53-4121

Major flood events in the Main River basin and their associated effective precipitation and snow-melt values. [Bedeutende Hochwasserereignisse im Maingebiet und das ihnen zugrundeliegende Niederschlagsangebot aus Regen und Schneeschmelze] Guttenberger, J., *Deutsche gewässerkundliche Mitteilungen*, Dec. 1994, 38(6), p.178-191, In German with English summary. 12 refs.

DLC GB651.D4 Vols.37-38 1993-94

Floods, Precipitation (meteorology), Snowmelt, Rain, Altitude, Snow water equivalent, Rivers, River basins, Snow depth, Topographic effects, Germany

53-4122

Arctic research of the United States, Vol.6. Fall 1992.

Myers, C.E., ed, Cate, D.W., ed, Valliere, D.R., ed, MP 5351, Washington, D.C., 1992, 91p. Organizations, Research projects, Regional planning, Health, Human factors, Economic development, United States—Alaska

53-4123

Arctic research of the United States, Vol.2. Fall 1988.

Brown, J., ed, Cate, D., ed, Valliere, D., ed, MP 5352, Washington, D.C., 1988, 102p. Organizations, Research projects, Meetings

53-4124

Participation of aeolian transport in the sedimentation of Pyrzyce ice dammed lake varves (west Pomerania). [Udział transportu eolicznego w sedymentacji warwiotwórczych pyrzyckiego (Pomorze Zachodnie)]

Karczewski, A., Paluszkiwicz, R., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1996, Vol.47, p.25-30, In Polish with English summary. 7 refs.

DLC GB276.P6B32 Vol.47 1996

Eolian soils, Sedimentation, Ice dams, Glacial lakes, Lacustrine deposits, Glacial geology, Sands, Grain size, Particle size distribution, Poland

53-4125

Wysoka Mountain as a probable limit of the pomeranian phase in the Zabin region of the Drawskie lakeland. [Góra Wysoka, jako prawdopodobna granica fazy pomorskiej, w rejonie Zabiny na Pojezierzu Drawskim]

Kłysz, P., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1996, Vol.47, p.31-41, In Polish with English summary. 25 refs.

DLC GB276.P6B32 Vol.47 1996

Geomorphology, Paleoclimatology, Glacial geology, Moraines, Mountains, Glacial deposits, Grain size, Particle size distribution, Abrasion, Glacial till, Ice cover, Poland—Wysoka Mountain

53-4126

Lithogenesis of a rhythmically stratified sedimentary series at Okunicy near Pyrzyce (west Pomerania). [Litogeneza serii osadowej rytmicznie warstwowej w Okunicy pod Pyrzycami (Pomorze Zachodnie)]

Paluszkiwicz, R., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1996, Vol.47, p.69-77, In Polish with English summary. 7 refs.

DLC GB276.P6B32 Vol.47 1996

Lacustrine deposits, Glacial lakes, Ice dams, Paleoclimatology, Geomorphology, Lithology, Grain size, Particle size distribution, Poland

53-4127

Impact of man-made processes on the river flow, with special attention paid to extreme phenomena: the case of the Kiełbaska and Widawka river catchments. [Wpływ procesów antropogenicznych na wielkość odpływu rzeczny ze szczególnym uwzględnieniem zjawisk ekstremalnych na przykładzie zlewni Kiełbaski i Widawki]

Wrzesiński, D., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1996, Vol.47, p.127-141, In Polish with English summary. 10 refs.

DLC GB276.P6B32 Vol.47 1996

River flow, Runoff, Flooding, Snowmelt, Mining, Precipitation (meteorology), Environmental impact, Poland—Kiełbaska River, Poland—Widawka River

53-4128

Ventifacts and frost fissures in the foreland of the Poznań phase of the last glaciation—the Poznań till plain. [Eololiptolity i struktury po klinach zmarzlinowych w strefie przedpola fazy poznańskiej ostatniego zlodowacenia na Wysoczyźnie Poznańskiej]

Antczak-Górka, B., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1995, Vol.46, p.7-17, In Polish with English summary. 27 refs.

DLC GB276.P6B32 Vol.46 1995

Paleoclimatology, Periglacial processes, Geomorphology, Eolian soils, Sands, Abrasion, Glaciation, Particle size distribution, Epigenesis, Frost shattering, Geocryology, Patterned ground, Poland

53-4129

Characteristics and diagnostic features of vistulian basal lodgement till as indicators of dynamics of depositional environment of the last glaciation in the Great Poland lowland. [Właściwości i cechy diagnostyczne bazalnych glin morenowych wistulianu, jako wyraz dynamiki środowiska depozycyjnego ostatniego lądolodu na Nizinie Wielkopolskiej]

Górska, M., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1995, Vol.46, p.29-62, In Polish with English summary. 84 refs.

DLC GB276.P6B32 Vol.46 1995

Paleoclimatology, Glacial till, Geocryology, Glacial geology, Tectonics, Clay soils, Poland

53-4130

Lithofacies analysis and loess sequences in the contact zone with glacial deposits of the last glaciation pomeranian phase at Stare Objezierze, West Pomerania. [Analiza litofacyjna i litostratygrafia osadów lessowych w strefie kontaktu z osadami glacialnymi fazy pomorskiej ostatniego zlodowacenia w Starym Objezierzu, Pomorze Zachodnie]

Issmer, K., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1995, Vol.46, p.63-84, In Polish with English summary. 30 refs.

DLC GB276.P6B32 Vol.46 1995

Loess, Glacial deposits, Glacial till, Paleoclimatology, Glaciation, Particle size distribution, Permafrost origin, Poland

53-4131

Petrographic studies of morainic deposits in the Drawskie Lakeland. [Badania petrograficzne osadów morenowych na Pojezierzu Drawskim]

Kłysz, P., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1995, Vol.46, p.85-94, In Polish with English summary. 25 refs.

DLC GB276.P6B32 Vol.46 1995

Glacial till, Subglacial observations, Moraines, Lithology, Stratigraphy, Poland

53-4132

Varves in the vicinity of Strzyżno near Kluczewo as an example of sedimentation conditions in the littoral zone of proglacial basin. [Warwidy koło Strzyżna pod Kluczewem jako przykład warunków sedymentacji osadów strefy litoralnej basenu proglacialnego]

Paluszkiwicz, R., *Badania fizjograficzne nad Polską zachodnią. Ser. A geografia fizyczna*, 1995, Vol.46, p.127-137, In Polish with English summary. 7 refs.

DLC GB276.P6B32 Vol.46 1995

Sedimentation, Pleistocene, Moraines, Grain size, Particle size distribution, Glacial lakes, Glacial deposits, Glacial geology, Poland

53-4133

Study of glacial and cryo-nival relief in the Romanian Carpathians—prospects and results. [La recherche du relief glaciaire et cryo-nival dans les Carpates roumaines—Résultats et perspectives]

Niculescu, G., *Revue roumaine de géographie*, 1994, No.4, p.11-20, In French with English summary. 56 refs.

DLC GB276.R8R4 T.38 1994

Nival relief, Geomorphology, Glacial geology, Pleistocene, Mountain glaciers, Valleys, Paleoclimatology, Romania—Carpathian Mountains



53-4134

Processes, formations and quaternary morphoclimatic stages on the hilly regions of Romania.

Mac, I., *Revue roumaine de géographie*, 1994, No.4, p.21-31, With French summary. 14 refs.

DLC GB276.R8R4 T.38 1994

Geomorphology, Paleoclimatology, Geochronology, Terraces, Glacial geology, Quaternary deposits, Romania

53-4135

Aspects of the glacial relief in the southern Gramplains of Scotland.

Florea, M., *Revue roumaine de géographie*, 1994, No.4, p.123-127, With French summary. 7 refs.

DLC GB276.R8R4 T.38 1994

Glacial geology, Geomorphology, Periglacial processes, Topographic features, Watersheds, United Kingdom—Scotland

53-4136

Late Quaternary glaciation and postglacial stratigraphy of the Northern Pacific margin of Canada.

Barrie, J.V., Conway, K.W., *Quaternary research*, Mar. 1999, 51(2), p.113-123, 39 refs.

Glaciation, Glacial geology, Glacial deposits, Glacier oscillation, Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Isostasy, Sea level, Stratigraphy, Paleoclimatology, Canada—British Columbia—Queen Charlotte Islands, United States—Alaska

53-4137

Late-glacial to early Holocene climate changes from a central Appalachian pollen and macrofossil record.

Kneller, M., Peteet, D., *Quaternary research*, Mar. 1999, 51(2), p.133-147, Refs. p.145-147.

Vegetation patterns, Plant ecology, Paleobotany, Palynology, Lacustrine deposits, Quaternary deposits, Fossils, Global change, Paleoclimatology, United States—Virginia—Appalachian Mountains

53-4138

Quaternary moraines vs catastrophic rock avalanches in the Karakoram Himalaya, northern Pakistan.

Hewitt, K., *Quaternary research*, May 1999, 51(3), p.220-237, 41 refs.

Alpine glaciation, Glacial geology, Glacial deposits, Moraines, Talus, Landslides, Avalanche deposits, Quaternary deposits, Pakistan—Karakoram Mountains

53-4139

Fluctuations of outlet and valley glaciers in the southern Andes (Argentina) during the past 13,000 years.

Wenzens, G., *Quaternary research*, May 1999, 51(3), p.238-247, 35 refs.

Alpine glaciation, Mountain glaciers, Glacial geology, Glacial deposits, Glacier oscillation, Lacustrine deposits, Quaternary deposits, Soil dating, Geochronology, Paleoclimatology, Argentina—Andes

53-4140

Effects of climate change on soils in glacial deposits, Wind River Basin, Wyoming.

Hall, R.D., *Quaternary research*, May 1999, 51(3), p.248-261, 35 refs.

Alpine glaciation, Glacial geology, Glacial deposits, Glacial till, Quaternary deposits, Wind erosion, Cryoturbation, Soil formation, Frost weathering, Outwash, Moraines, Soil dating, Paleoclimatology, United States—Wyoming—Wind River Basin

53-4141

Parameterisation of atmospheric boundary layer processes in a regional climate model of the Arctic. [Parameterisierung atmosphärischer Grenzschichtprozesse in einem regionalen Klimamodell der Arktis]

Abegg, C., *Berichte zur Polarforschung*, 1999, No.311, 120p., In German with English summary. Refs. p.108-112.

Polar atmospheres, Atmospheric circulation, Atmospheric boundary layer, Turbulent exchange, Heat flux, Humidity, Moisture transfer, Mathematical models, Computerized simulation, Canada—Northwest Territories—Norman Wells, Russia—Noril'sk

53-4142

Variability of the arctic ozone layer: analysis and interpretation of ground-based millimeter wave measurements. [Variabilität der arktischen Ozonschicht: Analyse und Interpretation bodengebundener Millimeterwellenmessungen]

Sinnhuber, B.M., *Berichte zur Polarforschung*, 1999, No.309, 186p., In German with English summary. Refs. p.169-186.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Ozone, Radiometry, Radiation measuring instruments, Meteorological instruments, Mathematical models, Computerized simulation, Norway—Spitsbergen

53-4143

ARCTIC '98: the Expedition ARK-XIV/1a of RV *Polarstern* in 1998.

Jokat, W., ed, *Berichte zur Polarforschung*, 1999, No.308, 159p., 40 refs.

Oceanographic surveys, Ice conditions, Ice cover thickness, Ice navigation, Icebreakers, Marine geology, Seismic surveys, Marine deposits, Bottom sediment, Bottom topography, Ice sampling, Snow samplers, Core samplers, Arctic Ocean, Russia—Laptev Sea

53-4144

Reconstruction of sea-ice drift and terrigenous sediment supply in the Late Quaternary: heavy-mineral associations in sediments of the Laptev-Sea continental margin and the central Arctic Ocean. [Rekonstruktion von Meerelsdrift und terrigenem Sedimenteintrag im Spätquartär: Schwermineralassoziationen in Sedimenten des Laptev-See-Kontinentalrandes und des zentralen Arktischen Ozeans]

Behrends, M., *Berichte zur Polarforschung*, 1999, No.310, 167p., In German with English summary. Refs. p.118-131.

Marine geology, Marine deposits, Bottom sediment, Drift, Ice rafting, Glaciation, Sediment transport, Core samplers, Paleoclimatology, Arctic Ocean, Russia—Laptev Sea

53-4145

Proceedings of the First Workshop on the Baltic Sea Ice Climate.

Leppäranta, M., ed, Haapala, J., ed, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993, *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, 249p., Refs. passim. For individual papers see 53-4146 through 53-4168.

DLC GB2533.B35W67 1993

Sea ice, Sea ice distribution, Ice models, Ice cover effect, Air ice water interaction, Baltic Sea

53-4146

Baltic Sea ice climate: an introduction.

Leppäranta, M., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.5-16, 21 refs.

DLC GB2533.B35W67 1993

Sea ice distribution, Freezeup, Ice models, Ice breakup, Ice cover thickness, Ice water interface, Climatology, Marine meteorology, Baltic Sea

53-4147

Hydrodynamical and ecological modelling in the Baltic Sea.

Tamsalu, R., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.17-31, 18 refs.

DLC GB2533.B35W67 1993

Hydrodynamics, Mathematical models, Marine biology, Ecosystems, Plankton, Baltic Sea, Finland, Gulf, Bothnia, Gulf

53-4148

On the role of the sea ice in the redistribution of fresh water and energy in the Baltic Sea.

Omstedt, A., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.33-40, 10 refs.

DLC GB2533.B35W67 1993

Sea ice, Ice cover effect, Analysis (mathematics), Heat flux, Advection, Air ice water interaction, Ice melting, Salinity, Seasonal variations, Baltic Sea, Finland, Gulf, Bothnia, Gulf

53-4149

Physically based models of the atmosphere.

Kaurola, J., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.41-53, 14 refs.

DLC GB2533.B35W67 1993

Models, Atmospheric circulation, Climatology, Sea ice, Weather forecasting, Data processing, Air ice water interaction, Baltic Sea

53-4150

Hydrothermodynamic model of the short-term ice forecast in the Gulf of Finland eastern part.

Kliachkin, S.V., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.55-72, 9 refs.

DLC GB2533.B35W67 1993

Ice forecasting, Sea ice distribution, Hydrodynamics, Thermodynamics, Ice edge, Ice models, Mathematical models, Baltic Sea, Finland, Gulf

53-4151

Some results of the WMO project "Climate of the Baltic Sea basin".

Mietus, M., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.73-85.

DLC GB2533.B35W67 1993

Marine meteorology, Air temperature, Air water interactions, Wind velocity, Atmospheric circulation, Atmospheric pressure, Snow cover, Precipitation (meteorology), Baltic Sea

53-4152

Ice time series of the Baltic Sea.

Seinä, A., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.87-90, 9 refs.

DLC GB2533.B35W67 1993

Sea ice distribution, Ice forecasting, Ice air interface, Ice cover thickness, Ice breakup, Baltic Sea, Finland, Gulf, Bothnia, Gulf

53-4153

Tallinn time series of break-up as climate indicator.

Tarand, A., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.91-93, 2 refs.

DLC GB2533.B35W67 1993

Sea ice, Ice air interface, Ice breakup, History, Ice navigation, Climatology, Baltic Sea, Finland, Gulf

53-4154

Data programme for Baltic Sea ice climate modeling.

Haapala, J., Leppäranta, M., Omstedt, A., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.95-107, 38 refs.

DLC GB2533.B35W67 1993

Models, Sea ice, Climatology, Air ice water interaction, Solar radiation, Hydrography, Baltic Sea

53-4155

Long time ice variabilities and conditions in the Kurschiu Gulf.

Dubra, J., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.109-122, 5 refs.

DLC GB2533.B35W67 1993

Sea ice distribution, Ice cover thickness, Ice air interface, Ice cracks, Baltic Sea, Lithuania—Klaipeda

53-4156

General outline of ice conditions in the Puck Bay.

Szefer, K., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.123-139, 11 refs.

DLC GB2533.B35W67 1993

Sea ice, Ice cover thickness, Freezep, Ice pileup, Pressure ridges, Ice breakup, Hummocks, Ice air interface, Baltic Sea, Poland—Gdańsk, Gulf, Poland—Puck Bay

53-4157

On the seasonal sea surface temperature variations in the Gulf of Finland.

Haapala, J., Alenius, P., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.141-148, 14 refs.

DLC GB2533.B35W67 1993

Sea water, Water temperature, Surface temperature, Seasonal variations, Baltic Sea, Finland, Gulf

53-4158

Role of the sea ice in the year-to-year water temperature variability in the bottom layer of the Gulf of Riga.

Zakharchenko, E., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.149-156, 6 refs.

DLC GB2533.B35W67 1993

Sea ice, Ice cover effect, Sea water, Water temperature, Ice water interface, Temperature variations, Baltic Sea, Riga, Gulf

53-4159

Statistical method for long-range forecast of the Baltic Sea iciness.

Meshcherskaia, A.V., Margasova, V.G., Beliankina, I.G., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.157-166, 5 refs.

DLC GB2533.B35W67 1993

Sea ice distribution, Ice forecasting, Long range forecasting, Statistical analysis, Accuracy, Baltic Sea

53-4160

Baltic Sea ice as growth habitat for phytoplankton.

Kuosa, H., *Helsinki. University. Department of Geophysics. Report series in geophysics*, 1993, No.27, Workshop on the Baltic Sea Ice Climate, 1st, Tvärminne, Finland, Aug. 24-26, 1993. Proceedings. Edited by M. Leppäranta and J. Haapala, p.167-173, 1 ref.

DLC GB2533.B35W67 1993

Plankton, Marine biology, Microbiology, Brines, Sea ice, Algae, Frazil ice, Photosynthesis, Chlorophylls, Subglacial observations, Baltic Sea, Antarctica

53-4161

Multispectral remote diagnostics of ice cover parameters of inland waterbodies.

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DLC GB2533.B35W67 1993

Remote sensing, Sea ice, Ice cover, Frazil ice, Impurities, Snow impurities, Air ice water interaction, Environmental impact, Pollution, Measurement, Microwaves, Radiometry, Snow cover, Baltic Sea, Finland, Gulf, Russia—Ladoga, Lake, Russia—Onega Lake

53-4162

Method of integrated assessment of secondary technogenic impact of harmful matter contained in ice cover on marine environment.

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DLC GB2533.B35W67 1993

Environmental impact, Pollution, Air water interactions, Ecosystems, Metals, Sea ice, Ice cover, Ice growth, Ice melting, Snow ice interface, Snow melting, Analysis (mathematics), Baltic Sea

53-4163

Nansen International Environmental and Remote Sensing Centre and its scientific activity.

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Ecology, Environmental protection, Organizations, Research projects, International cooperation, Baltic Sea, Finland, Gulf, Russia—Ladoga, Lake, Russia—St. Petersburg

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DLC GB2533.B35W67 1993

Dams, Design criteria, Flooding, Drift, Ice floes, Hummocks, River ice, Ice cover thickness, Fast ice, Ice conditions, Ice melting, Baltic Sea, Finland, Gulf, Russia—Neva River

53-4165

Rafted ice in the mass balance of the Baltic ice cover.

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Sea ice, Ice cover, Ice rafting, Mass balance, Ice models, Mathematical models, Ice cover thickness, Baltic Sea

53-4166

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53-4167

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Frost resistance, Freezing rate, Cooling rate, Freeze thaw cycles, Freeze thaw tests, Ice lenses, Saturation, Concretes, Concrete strength, Concrete freezing, Air entrainment

53-4168

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Abrasion, Ice solid interface, Sea ice, Offshore structures, Sea water, Damage, Concrete strength, Flexural strength, Tensile properties, Water cement ratio, Compressive properties, Mathematical models, Bothnia, Gulf

53-4170

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Concrete durability, Concrete freezing, Concrete strength, Laboratory techniques, Frost resistance, Offshore structures, Water cement ratio, Ice lenses, Air entrainment, Concretes, Freeze thaw tests, Capillary ice

- 53-4171**  
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Glaciation, Glacial geology, Glacier oscillation, Glacial deposits, Ice rafting, Marine geology, Marine deposits, Bottom sediment, Stratigraphy, Soil dating, Geochronology, Paleoclimatology, Greenland—Scoresby Sund
- 53-4172**  
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Loess, Eolian soils, Periglacial processes, Quaternary deposits, Stratigraphy, Soil profiles, Soil dating, Paleoclimatology, Germany
- 53-4175**  
Snow cover on the Szrenica Mountain during 1960-1990. [Pokrywa śnieżna na szrenicy w latach 1960-1990 i klasyfikacja śnieżności zim]  
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Snow depth, Snow cover, Statistical analysis, Snow compaction, Classifications, Poland—Szrenica Mountain
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Snow cover, Chemical properties, Snow impurities, Air pollution, Ablation, Precipitation (meteorology), Poland—Kleśnica River
- 53-4177**  
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- 53-4180**  
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- 53-4182**  
Analysis of multi-temporal ERS-1 SAR data of subarctic tundra and forest in the northern Hudson Bay Lowland and implications for climate studies.  
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- 53-4183**  
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Permafrost surveys, Permafrost distribution, Permafrost indicators, Ice wedges, Patterned ground, Polygonal topography, Active layer, Thermokarst, Landslides, Terrain identification, Spaceborne photography, Canada—Northwest Territories—Ellesmere Island
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Plains, Vegetation patterns, Revegetation, Plant ecology, Paleobotany, Desiccation, Precipitation (meteorology), Climatic changes, Global warming, Canada—Alberta, Canada—Saskatchewan

53-4191

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53-4192

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53-4193

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Climatic changes, Global warming, Environmental impact, Cost analysis, Regional planning, Canada

53-4194

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53-4195

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53-4196

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53-4197

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53-4198

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53-4199

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53-4200

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53-4201

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53-4202

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53-4203

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53-4204

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53-4205

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Peat, Swamps, Drainage, Trees (plants), Plant ecology, Phenology, Paleobotany, Air temperature, Precipitation (meteorology), Climatic changes, Paleoclimatology, Statistical analysis, Sweden

53-4206

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53-4207

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Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Ice vapor interface, Adsorption, Aerosols, Ice nuclei, Heterogeneous nucleation, Ozone

53-4208

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Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice vapor interface, Heterogeneous nucleation, Ice nuclei, Polar stratospheric clouds, Ozone

53-4209

Phase transitions in emulsified HNO<sub>3</sub>/H<sub>2</sub>O and HNO<sub>3</sub>/H<sub>2</sub>SO<sub>4</sub>/H<sub>2</sub>O solutions.

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Polar atmospheres, Atmospheric composition, Aerosols, Polar stratospheric clouds, Cloud physics, Heterogeneous nucleation, Freezing nuclei, Liquid solid interfaces, Phase transformations, Ozone

53-4210

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Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Amorphous ice, Doped ice, Ice electrical properties, Proton transport, Ionization

53-4211

Interaction of H<sub>2</sub> with water ice by neutron scattering: rotation and translation.

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Ice crystal structure, Deuterium oxide ice, Ice spectroscopy, Molecular structure, Molecular energy levels, Neutron scattering

53-4212

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Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Ice shelves, Sea ice, Ice cover effect, Ice water interface, Polynyas, Bottom sediment, Suspended sediments, Antarctica—Ross Sea

53-4213

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DLC GC245.3.O34 1999

Oceanographic surveys, Sea water, Water temperature, Salinity, Ocean currents, Water transport, Sea ice distribution, Ice shelves, Ice water interface, Polynyas, Antarctica—Ross Sea

## 53-4214

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DLC GC245.3.034 1999

Ice surveys, Sea ice distribution, Ice cover thickness, Frazil ice, Sea water freezing, Ice water interface, Ocean waves, Wave propagation, Synthetic aperture radar, Spaceborne photography, Mathematical models, Antarctica

## 53-4215

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Air water interactions, Wind factors, Ocean bottom, Bottom topography, Topographic effects, Antarctica

## 53-4216

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Sea level, Height finding, Spaceborne photography, Statistical analysis, Antarctica

## 53-4217

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Surface temperature, Antarctica

## 53-4218

**Large-scale thermohaline structure of the Ross Gyre.**

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Antarctica—Ross Sea

## 53-4219

**Temporal variability of currents in the Ross Sea (Antarctica).**

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Tidal currents, Water transport, Sea water freezing, Ice melting, Water temperature, Salinity, Ice shelves, Ice water interface, Ice cover effect, Antarctica—Ross Sea

## 53-4220

**Reconstructing the general circulation of the Ross Sea (Antarctica) using a robust diagnostic model.**

Bergamasco, A., Carniel, S., Valeri, L.C., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.119-134, 6 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Ice shelves, Ice water interface, Ice cover effect, Wind factors, Computerized simulation, Antarctica—Ross Sea

## 53-4221

**Wind and boundary driven circulation model of the Ross Sea.**

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DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Air water interactions, Wind factors, Computerized simulation, Antarctica—Ross Sea

## 53-4222

**Wintertime expansion and contraction of the Terra Nova Bay polynya.**

Van Woert, M.L., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.145-164, 46 refs.  
DLC GC245.3.034 1999

Sea ice distribution, Ice conditions, Polynyas, Air ice water interaction, Sea water freezing, Ice heat flux, Ice formation, Ocean currents, Water transport, Salinity, Wind factors, Mathematical models, Antarctica—Terra Nova Bay

## 53-4223

**Current, temperature and salinity observations in the Terra Nova Bay polynya area.**

Manzella, G.M.R., Meloni, R., Picco, P., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.165-173, 10 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Air ice water interaction, Sea ice distribution, Ice conditions, Polynyas, Antarctica—Terra Nova Bay

## 53-4224

**Particle fluxes at the edge of the Ross Ice Shelf: the role of physical forcing.**

Accornero, A., Bergamasco, A., Monaco, A., Tucci, S., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.177-195, 56 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Sea water, Suspended sediments, Bottom sediment, Marine deposits, Ice shelves, Ice cover effect, Ice edge, Ice water interface, Sedimentation, Biomass, Nutrient cycle, Antarctica—Ross Ice Shelf

## 53-4225

**Actual sedimentation on the antarctic continental shelf (southern part of the Ross Sea).**

Tucci, S., Ferrari, M., Capello, M., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.197-207, 16 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Sea water, Water temperature, Salinity, Suspended sediments, Sedimentation, Bottom sediment, Marine deposits, Ice shelves, Ice water interface, Ice cover effect, Antarctica—Ross Sea

## 53-4226

**Particle fluxes and sediment characteristics at three selected sites in the Ross Sea (Antarctica).**

Ravaoli, M., Frignani, M., Gambi, M.C., Labbrozzi, L., Langone, L., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.209-222, 28 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Marine geology, Marine deposits, Bottom sediment, Sediment transport, Sedimentation, Nutrient cycle, Biomass, Core samplers, Soil dating, Antarctica—Ross Sea

## 53-4227

**General characteristics of density-turbidity currents in the Ross Sea (Antarctica).**

Cordero, S.G., Salusti, E., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.223-232, 26 refs.  
DLC GC245.3.034 1999

Ocean currents, Bottom sediment, Suspended sediments, Sediment transport, Bottom topography, Topographic effects, Turbidity, Turbulent flow, Mathematical models, Antarctica—Ross Sea

## 53-4228

**Vertical distribution and biochemical composition of pico- and microparticulate organic matter in the Ross Sea (Antarctica).**

Fabiano, M., Danovaro, R., Povero, P., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.233-246, 32 refs.  
DLC GC245.3.034 1999

Oceanographic surveys, Sea water, Water chemistry, Suspended sediments, Plankton, Bacteria, Marine biology, Biomass, Nutrient cycle, Antarctica—Ross Sea

## 53-4229

**On the heat energy fluxes in the non-stationary surface boundary layer at Hells Gate, Terra Nova Bay (Antarctica).**

Ferrarese, S., et al., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.249-264, 14 refs.  
DLC GC245.3.034 1999

Polar atmospheres, Atmospheric boundary layer, Wind velocity, Air temperature, Anemometers, Ice shelves, Ice air interface, Ice heat flux, Glacial meteorology, Mathematical models, Antarctica—Hells Gate

## 53-4230

**Meteorological conditions during snowfall at Terra Nova Bay (Antarctica).**

Pellegrini, A., Della Vedova, A.M., Grigioni, P., De Silvestri, L., *Oceanography of the Ross Sea, Antarctica*. Edited by G. Spezie and G.M.R. Manzella, Milan, Italy, Springer-Verlag, 1999, p.265-286, 30 refs.  
DLC GC245.3.034 1999

Polar atmospheres, Atmospheric circulation, Precipitation (meteorology), Snowfall, Blowing snow, Snow accumulation, Snow ice interface, Humidity, Wind velocity, Wind direction, Weather stations, Antarctica—Terra Nova Bay

## 53-4231

**Cold weather concreting.**

Korhonen, C., MP 5353, *Military engineer*, Aug.-Sep. 1998, 90(593), p.47-48.

Winter concreting, Concrete admixtures, Water cement ratio, Freezing points, Concrete curing, Frost protection

53-4232

**Operational forecast of ice inflow to reservoir W/ ocławek on Vistula River.** [Operacyjna prognoza dopływu lodu do zbiornika W/ocławek na Wiśle] Dobrowolski, A., Zelazinski, J., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1994, 17(1), p.75-82, In Polish with Russian and English table of contents. 4 refs.  
DLC QC869.4.P63W56 Vol.17 1994  
River ice, Reservoirs, Ice forecasting, Analysis (mathematics), Ice jams, Poland—Vistula River

53-4233

**Water expulsion during soil freezing described by a mathematical model called  $M_1$ .** Nakano, Y., MP 5354, *Cold regions science and technology*, 1999, Vol.29, p.9-30, 46 refs.  
Soil freezing, Mathematical models, Freezing front, Water transport, Soil water, Saturation  
It has been shown empirically that when a freezing front advances through a saturated and unfrozen soil, soil water may either be attracted to the freezing front or expelled, depending upon soil type, applied confining pressure, and rate of freezing. In this work, the problem of water expulsion is studied analytically based on a mathematical model called  $M_1$ . The condition of water expulsion is found to depend on the properties of a given soil, given thermal and hydraulic conditions. The theoretical predictions are compared with data of Kanto loam and the agreement between them is found to be satisfactory.

53-4234

**Pollen analysis and  $^{14}\text{C}$  age of moss remains in a permafrost core recovered from the active rock glacier Murtel-Corvatsch, Swiss Alps: geomorphological and glaciological implications.** Haeberli, W., et al, *Journal of glaciology*, 1999, 45(149), p.1-8, 41 refs.  
Palynology, Pollen, Radioactive age determination, Rock glaciers, Mosses, Drill core analysis, Permafrost dating, Geomorphology, Paleoclimatology, Switzerland—Alps

53-4235

**Correlations between glacier properties: finding appropriate parameters for global glacier monitoring.** Diurigerov, M.B., Bahr, D.B., *Journal of glaciology*, 1999, 45(149), p.9-16, 42 refs.  
Correlation, Glacier mass balance, Glacier surveys, Glacier oscillation, Data processing

53-4236

**Characteristic mass-balance scaling with valley glacier size.** Bahr, D.B., Diurigerov, M.B., *Journal of glaciology*, 1999, 45(149), p.17-21, 16 refs.  
Glacier mass balance, Glacier ablation, Glacier alimentation, Cirque glaciers, Analysis (mathematics), Mountain glaciers, Volume

53-4237

**Air clathrate crystals from the GRIP deep ice core, Greenland: a number-, size- and shape-distribution study.** Pauer, F., Kipfstuhl, S., Kuhs, W.F., Shoji, H., *Journal of glaciology*, 1999, 45(149), p.22-30, 27 refs.  
Clathrates, Ice cores, Oxygen isotopes, Statistical analysis, Bubbles, Ice air interface, Greenland

53-4238

**Coupling between a glacier and a soft bed: I. A relation between effective pressure and local shear stress determined from till elasticity.** Iverson, N.R., Baker, R.W., Hooke, R.L., Hanson, B., Jansson, P., *Journal of glaciology*, 1999, 45(149), p.31-40, 50 refs.  
Glacier beds, Shear stress, Glacial till, Water pressure, Elastic properties, Measuring instruments, Subglacial observations, Canada—Yukon Territory—Trapridge Glacier, Sweden—Storglaciären

53-4239

**Coupling between a glacier and a soft bed: II. Model results.** Iverson, N.R., *Journal of glaciology*, 1999, 45(149), p.41-53, 50 refs.  
Glacier beds, Shear stress, Glacial till, Glacier flow, Rheology, Glacier surfaces, Basal sliding, Water pressure, Mathematical models, Sweden—Storglaciären, Antarctica—West Antarctica

53-4240

**Investigation of the debris-rich basal ice from Worthington Glacier, Alaska, U.S.A.** Hart, J.K., Waller, R.I., *Journal of glaciology*, 1999, 45(149), p.54-62, 53 refs.  
Mountain glaciers, Bubbles, Glacier ice, Ice composition, Subglacial observations, Moraines, Glacial deposits, Deformation, United States—Alaska—Worthington Glacier

53-4241

**Faceted crystal formation in the northeast Greenland low-accumulation region.** Steffen, K., Abdalati, W., Sherjal, I., *Journal of glaciology*, 1999, 45(149), p.63-68, 28 refs.  
Snow stratigraphy, Snow crust, Snow samplers, Snow crystal growth, Snow accumulation, Temperature gradients, Greenland

53-4242

**Debris entrainment and transfer in polythermal valley glaciers.** Hambrey, M.J., Bennett, M.R., Dowdeswell, J.A., Glasser, N.F., Huddart, D., *Journal of glaciology*, 1999, 45(149), p.69-86, 66 refs.  
Mountain glaciers, Sediment transport, Glacier beds, Glacier surveys, Stratification, Subglacial observations, Glacier surfaces, Glacial geology, Norway—Svalbard

53-4243

**Controls on the major-ion chemistry of the Dokriani glacier meltwaters, Ganga basin, Garhwal Himalaya, India.** Hasnain, S.I., Thayyen, R.J., *Journal of glaciology*, 1999, 45(149), p.87-92, 25 refs.  
Meltwater, Glacier melting, Ions, Glacier ice, Ice composition, Water chemistry, Rain, Weathering, Glacial hydrology, India—Garhwal Himalaya

53-4244

**Flow of Glacier Moreno, Argentina, from repeat-pass Shuttle Imaging Radar images: comparison of the phase correlation method with radar interferometry.** Michel, R., Rignot, E., *Journal of glaciology*, 1999, 45(149), p.93-100, 23 refs.  
Glacier flow, Radar photography, Spaceborne photography, Glacier surveys, Glacier surfaces, Velocity measurement, Accuracy, Image processing, Photointerpretation, Topographic features, Ice volume, Argentina—Moreno Glacier

53-4245

**Distributed temperature-index ice- and snowmelt model including potential direct solar radiation.** Hock, R., *Journal of glaciology*, 1999, 45(149), p.101-111, 46 refs.  
Mathematical models, Snowmelt, Meltwater, Solar radiation, Glacier ablation, Degree days, Air temperature, Temperature effects, Diurnal variations, Sweden—Storglaciären

53-4246

**Mass-balance studies on Siachen Glacier in the Nubra valley, Karakoram Himalaya, India.** Bhutiyani, M.R., *Journal of glaciology*, 1999, 45(149), p.112-118, 18 refs.  
Glacier mass balance, Mountain glaciers, Glacial hydrology, Glacier ablation, Meltwater, Accuracy, India—Karakoram Mountains, India—Himalaya Mountains

53-4247

**Seismic detection of transient changes beneath Black Rapids Glacier, Alaska, U.S.A.: I. Techniques and observations.** Nolan, M., Echelmeyer, K., *Journal of glaciology*, 1999, 45(149), p.119-131, 30 refs.  
Glacier beds, Glacier oscillation, Seismic reflection, Subglacial drainage, Seismic surveys, Mountain glaciers, Glacial lakes, United States—Alaska—Black Rapids Glacier

53-4248

**Seismic detection of transient changes beneath Black Rapids Glacier, Alaska, U.S.A.: II. Basal morphology and processes.** Nolan, M., Echelmeyer, K., *Journal of glaciology*, 1999, 45(149), p.132-146, 58 refs.  
Mountain glaciers, Seismic reflection, Glacial hydrology, Glacier beds, Glacial till, Water pressure, Shear strength, Saturation, United States—Alaska—Black Rapids Glacier

53-4249

**Conditions for bubble elongation in cold ice-sheet ice.** Alley, R.B., Fitzpatrick, J.J., *Journal of glaciology*, 1999, 45(149), p.147-153, 40 refs.  
Bubbles, Ice sheets, Ice deformation, Vapor transfer, Self diffusion, Vapor diffusion, Analysis (mathematics), Antarctica—Taylor Dome

53-4250

**Reliability analysis for design of stake networks to measure glacier surface velocity.** Chadwell, C.D., *Journal of glaciology*, 1999, 45(149), p.154-164, 38 refs.  
Glacier surfaces, Velocity measurement, Statistical analysis, Accuracy, Analysis (mathematics), Geodetic surveys, Peru—Andes, China—Qinghai-Tibetan Plateau

53-4251

**Surface and bed topography of Trapridge Glacier, Yukon Territory, Canada: digital elevation models and derived hydraulic geometry.** Flowers, G.E., Clarke, G.K.C., *Journal of glaciology*, 1999, 45(149), p.165-174, 32 refs.  
Glacier surfaces, Glacier beds, Topographic features, Ice models, Data processing, Glacier thickness, Radar echoes, Glacial hydrology, Height finding, Canada—Yukon Territory—Trapridge Glacier

53-4252

**Late Neogene Sirius Group strata in Reedy Valley, Antarctica: a multiple-resolution record of climate, ice-sheet and sea-level events.** Wilson, G.S., Harwood, D.M., Askin, R.A., Levy, R.H., *Journal of glaciology*, 1998, 44(148), p.437-447, 54 refs.  
Glacial geology, Stratigraphy, Paleoclimatology, Glacial deposits, Paleocology, Fossils, Paleobotany, Antarctica—Reedy Glacier

53-4253

**Stress and velocity fields in glaciers: Part I. finite-difference schemes for higher-order glacier models.** Colinge, J., Blatter, H., *Journal of glaciology*, 1998, 44(148), p.448-456, 21 refs. For part 2 see 53-4254.  
Mathematical models, Glacier beds, Glacier flow, Glacier oscillation

53-4254

**Stress and velocity fields in glaciers: Part II. sliding and basal stress distribution.** Blatter, H., Clarke, G.K.C., Colinge, J., *Journal of glaciology*, 1998, 44(148), p.457-466, 21 refs. For part I see 53-4253.  
Glacier beds, Glacier flow, Glacier oscillation, Mathematical models, Shear stress, Mountain glaciers, Canada—Yukon Territory—Trapridge Glacier, Switzerland—Haut Glacier d'Arolla

53-4255

**Diffusion of isotopes in the annual layers of ice sheets.** Nye, J.F., *Journal of glaciology*, 1998, 44(148), p.467-468, 8 refs.  
Mathematical models, Ice sheets, Oxygen isotopes, Layers, Unfrozen water content, Diffusion, Self diffusion, Glacial hydrology, Glacier ice, Ice composition, Ice dating, Antarctica, Greenland



## 53-4256

**Hinge-line migration of Petermann Gletscher, north Greenland, detected using satellite-radar interferometry.**

Rignot, E., *Journal of glaciology*, 1998, 44(148), p.469-476, 30 refs.

Glacier tongues, Glacier oscillation, Glacier flow, Mapping, Remote sensing, Synthetic aperture radar, Spaceborne photography, Glacier mass balance, Greenland—Petermann Gletscher

## 53-4257

**Depth-hoar growth rates near a rocky outcrop.**

Arons, E.M., Colbeck, S.C., Gray, J.M.N.T., MP 5355, *Journal of glaciology*, 1998, 44(148), p.477-484, 15 refs.

Depth hoar, Ice crystal growth, Rocks, Mathematical models, Seasonal variations, Snow cover, Snow density, Snow thermal properties, Soil temperature, Thermal conductivity, Snow depth

Observations of slab-avalanche releases in alpine terrain have led to the hypothesis that rocky outcrops can influence the spatial distributions of temperature and heat flow in dry alpine snow covers and thus control the local distribution of depth hoar. The authors investigate the effects of terrain on crystal growth by using a two-dimensional finite-element model of heat flow coupled with a model of crystal growth from vapor. The model is used to examine the influence of snow properties, terrain geometry and snow depth on this phenomenon. The effect is stronger in the early winter than in the late winter, because the rock has then had time to cool. In all cases, it was found that depth-hoar growth occurs preferentially over the rock. This suggests that snow-pit investigations made over soil can be misleading if rocky outcrops are present.

## 53-4258

**Modelling the evolution of subglacial tunnels due to varying water input.**

Cutler, P.M., *Journal of glaciology*, 1998, 44(148), p.485-497, 48 refs.

Subglacial observations, Ice tunnels, Ice water interface, Mathematical models, Ice models, Water pressure, Glacier ablation, Water level, Glacial hydrology, Subglacial drainage, Sweden—Storglaciären

## 53-4259

**Snow-transport model for complex terrain.**

Liston, G.E., Sturm, M., MP 5356, *Journal of glaciology*, 1998, 44(148), p.498-516, Refs. p.514-515.

Mathematical models, Snow depth, Snow cover distribution, Shear stress, Sublimation, Tundra terrain, Snow water equivalent, Wind factors, Blowing snow, Computerized simulation, Snowdrifts, Snow erosion, Wind erosion, United States—Alaska—Brooks Range

As part of the winter environment in middle- and high-latitude regions, the interactions between wind, vegetation, topography and snowfall produce snow covers of non-uniform depth and snow water-equivalent distribution. A physically based numerical snow-transport model is developed and used to simulate this three-dimensional snow-depth evolution over topographically variable terrain. The mass-transport model includes processes related to vegetation snow-holding capacity, topographic modification of wind speeds, snow-cover shear strength, wind-induced surface-shear stress, snow transport resulting from saltation and suspension, snow accumulation and erosion, and sublimation of the blowing and drifting snow. The model simulates the cold-season evolution of snow-depth distribution when forced with inputs of vegetation type and topography, and atmospheric forcings of air temperature, humidity, wind speed and direction, and precipitation. Model outputs include the spatial and temporal evolution of snow depth resulting from variations in precipitation, saltation and suspension transport, and sublimation. Using 4 years of snow-depth distribution observations from the foothills north of the Brooks Range in Arctic Alaska, the model is found to simulate closely the observed snow-depth distribution patterns and the interannual variability.

## 53-4260

**Estimation of hydraulic properties of subglacial till from ploughmeter measurements.**

Fischer, U.H., Iverson, N.R., Hanson, B., Hooke, R.L., Jansson, P., *Journal of glaciology*, 1998, 44(148), p.517-522, 29 refs.

Glacial till, Subglacial observations, Water pressure, Hydraulics, Water flow, Glacier beds, Glacial hydrology, Subglacial drainage, Sweden—Storglaciären

## 53-4261

**Accumulation and hoar effects on microwave emission in the Greenland ice-sheet dry-snow zones.**

Abdalati, W., Steffen, K., *Journal of glaciology*, 1998, 44(148), p.523-531, 37 refs.

Ice sheets, Hoarfrost, Microwaves, Snow accumulation, Snow cover effect, Firm, Snow ice interface, Brightness, Radiometry, Radiation balance, Snow optics, Greenland

## 53-4262

**Analysis of the 1993-95 Bering Glacier (Alaska) surge using differential SAR interferometry.**

Fatland, D.R., Lingle, C.S., *Journal of glaciology*, 1998, 44(148), p.532-546, 30 refs.

Glacier surges, Synthetic aperture radar, Mountain glaciers, Remote sensing, Glacier surveys, Spaceborne photography, Image processing, United States—Alaska—Bering Glacier, United States—Alaska—Bagley Icefield

## 53-4263

**Glaciohydraulic supercooling: a freeze-on mechanism to create stratified, debris-rich basal ice: I. field evidence.**

Lawson, D.E., Strasser, J.C., Evenson, E.B., Alley, R.B., Larson, G.J., Arcone, S.A., MP 5357, *Journal of glaciology*, 1998, 44(148), p.547-562, 62 refs.

Glacial hydrology, Supercooling, Glacier beds, Frazil ice, Glacial deposits, Ice growth, Subglacial observations, Subglacial drainage, Glacial till, Sediment transport, United States—Alaska—Matanuska Glacier

Debris-laden ice accretes to the base of Matanuska Glacier, AK, USA, from water that supercools while flowing in a distributed drainage system up the adverse slope of an overdeepening. Frazil ice grows in the water column and forms aggregates, while other ice grows on the glacier sole or on substrate materials. Sediment is trapped by this growing ice, forming stratified debris-laden basal ice. Growth rates of >0.1 m/a of debris-rich basal ice are possible. The large sediment fluxes that this mechanism allows may have implications for interpretation of the widespread deposits from ice that flowed through other overdeepenings, including Heinrich events and the till sheets south of the Laurentian Great Lakes.

## 53-4264

**Glaciohydraulic supercooling: a freeze-on mechanism to create stratified, debris-rich basal ice: II. theory.**

Alley, R.B., Lawson, D.E., Evenson, E.B., Strasser, J.C., Larson, G.J., MP 5358, *Journal of glaciology*, 1998, 44(148), p.563-569, 48 refs.

Glacial hydrology, Supercooling, Glacier beds, Subglacial observations, Subglacial drainage, Mathematical models, Regelation, Glacier ice, Ice accretion, Glacial till, Sediment transport, United States—Alaska—Matanuska Glacier

Simple theory supports field observations that subglacial water flow out of overdeepenings can cause accretion of layered, debris-bearing ice to the bases of glaciers. The large meltwater flux into a temperate glacier at the onset of summer melting can cause rapid water flow through expanded basal cavities or other flow paths. If that flow ascends a sufficiently steep slope out of an overdeepening, the water will supercool as the pressure-melting point rises, and basal-ice accretion will occur. Diurnal, occasional or annual fluctuations in water discharge will cause variations in accretion rate, debris content of accreted ice or subsequent diagenesis, producing layers. Under appropriate conditions, net accretion of debris-bearing basal ice will allow debris fluxes that are significant in the glacier sediment budget.

## 53-4265

**Elevation and volume changes on the Harding Ice-field, Alaska.**

Adalgeirsdóttir, G., Echelmeyer, K.A., Harrison, W.D., *Journal of glaciology*, 1998, 44(148), p.570-582, 31 refs.

Glacier surveys, Height finding, Glacier mass balance, Ice volume, Profiles, Airborne radar, Glacier thickness, Topographic surveys, United States—Alaska—Harding Icefield

## 53-4266

**Errors in daily ablation measurements in northern Greenland, 1993-94, and their implications for glacier climate studies.**

Braithwaite, R.J., Konzelmann, T., Marty, C., Olesen, O.B., *Journal of glaciology*, 1998, 44(148), p.583-588, 24 refs.

Glacier ablation, Climatic factors, Glacial meteorology, Accuracy, Degree days, Measurement, Glacier heat balance, Glacier mass balance, Greenland—Kroprins Christian Land, Greenland—Hans Tausen Ice Cap

## 53-4267

**Ice-stream surface texture, sticky spots, waves and breathers: the coupled flow of ice, till and water.**

Hindmarsh, R.C.A., *Journal of glaciology*, 1998, 44(148), p.589-614, 67 refs.

Glacial till, Water flow, Water pressure, Ice water interface, Ice sheets, Glacier flow, Analysis (mathematics), Stream flow, Subglacial drainage, Mathematical models, Glacier friction, Basal sliding, Antarctica—Siple Coast

## 53-4268

**Measurement of temperature in a margin of Ice Stream B, Antarctica: Implications for margin migration and lateral drag.**

Harrison, W.D., Echelmeyer, K.A., Larsen, C.F., *Journal of glaciology*, 1998, 44(148), p.615-624, 27 refs.

Ice temperature, Temperature measurement, Shear stress, Crevasses, Stream flow, Ice sheets, Glacier flow, Glacier friction, Antarctica—West Antarctica

## 53-4269

**Modeling the signature of a transponder in altimeter return data and determination of the reflection surface of the ice cap near the GRIP camp, Greenland.**

Haardeng-Pedersen, G., Keller, K., Tscherning, C.C., Gundestrup, N., *Journal of glaciology*, 1998, 44(148), p.625-633, 10 refs.

Mathematical models, Ice surface, Radar echoes, Measurement, Topographic features, Spaceborne photography, Reflection, Snow surface, Ice sheets, Glacier surveys, Glacier surfaces, Glacier thickness, Height finding, Greenland

## 53-4270

**Ring-shear studies of till deformation: Coulomb-plastic behavior and distributed strain in glacier beds.**

Iverson, N.R., Hooyer, T.S., Baker, R.W., *Journal of glaciology*, 1998, 44(148), p.634-642, 59 refs.

Glacier beds, Glacial till, Shear strain, Deformation, Strain measuring instruments, Porosity, Shear strength, Subglacial observations, Glacier flow, Glacier friction, Sweden—Storglaciären, United States—Michigan, Lake

## 53-4271

**Migration of the Siple Dome ice divide, West Antarctica.**

Nereson, N.A., Raymond, C.F., Waddington, E.D., Jacobell, R.W., *Journal of glaciology*, 1998, 44(148), p.643-652, 30 refs.

Radio echo soundings, Basal sliding, Glacier flow, Ice models, Mathematical models, Glacier oscillation, Glacier thickness, Ice sheets, Antarctica—West Antarctica

## 53-4272

**Thickening of the western part of the Greenland ice sheet.**

Thomas, R.H., Csathó, B.M., Gogineni, S., Jezek, K.C., Kuivinen, K., *Journal of glaciology*, 1998, 44(148), p.653-658, 14 refs.

Ice sheets, Ice cover thickness, Accuracy, Mass balance, Snow accumulation, Analysis (mathematics), Glacier thickness, Glacier mass balance, Greenland

53-4273

**Improved coherent radar depth sounder.**  
Gogineni, S., Chuah, T., Allen, C., Jezek, K.C., Moore, R.K., *Journal of glaciology*, 1998, 44(148), p.659-669, Refs. p.668-669.  
Sensors, Electronic equipment, Radio echo soundings, Design, Performance, Remote sensing, Ice sheets, Glacier mass balance, Ice cover thickness, Antennas, Glacier surveys, Glacier thickness, Greenland—Petermann Gletscher

53-4274

**Horizontal shear rate of ice initially exhibiting vertical compression fabrics.**  
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Paleoecology, Wetlands, Peat, Radioactive age determination, Pollen, Palynology, Clays, Paleoclimatology, Paleobotany, Canada—Quebec—Saint Lawrence River

53-4286

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Introduced plants, Windbreaks, Topography, Peat, Wetlands, Mosses, Plants (botany), Swamps, Environmental impact, Canada—Quebec

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Wetlands, Trees (plants), Hydrology, Evapotranspiration, Stream flow, Water balance, Water table, Nutrient cycle, Hydrography, Peat, Swamps, Frost penetration, Snow cover effect, Vegetation, Forest ecosystems, United States—Minnesota

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**Application of modeling methods to study water budgets in forested peatlands.**

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Wetlands, Peat, Trees (plants), Forest ecosystems, Mathematical models, Transpiration, Soil water, Hydrologic cycle, Biomass, Ground water

## 53-4294

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Drainage, Water table, Peat, Wetlands, Ground water, Environmental impact, Forest land, Vegetation, Surface drainage, Hydrography, Forest ecosystems, Canada—Alberta

## 53-4296

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Peat, Wetlands, Paleoclimatology, Pleistocene, Climatic changes, Carbon dioxide, Eurasia

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Forestry, Peat, Wetlands, Drainage, Environmental impact, Nutrient cycle, Agriculture, Finland

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## 53-4308

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Greenhouse effect, Swamps, Drainage, Forestry, Wetlands, Peat, Trees (plants), Forest ecosystems, Finland, Sweden, Norway

## 53-4309

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Wetlands, Trees (plants), Water table, Trenching, Water level, Ground water, Forestry, Finland

## 53-4310

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Forestry, Trees (plants), Wetlands, Peat, Plant ecology, Growth, Canada—Ontario—Lydia Lake

## 53-4311

**Hydrocarbon gases associated with permafrost in the Mackenzie Delta, Northwest Territories, Canada.**

Collett, T.S., Dallimore, S.R., *Applied geochemistry*, July 1999, 14(5), p.607-620, 31 refs. Permafrost surveys, Permafrost structure, Frozen ground chemistry, Geochemistry, Natural gas, Hydrates, Exploration, Well logging, Geothermy, Canada—Northwest Territories—Mackenzie Delta

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Cramer, S.M., *Wisconsin Department of Transportation, Madison. Division of Highways. Report*, Dec. 1995, WI-06-95, 13p. + append., PB98-134653, 13 refs.

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Aircraft icing, Ice accretion, Ice loads, Glaze, Ice air interface, Air flow

## 53-4314

**Blueprint for action. The President's action plan for recovery from the January 1998 ice storm.** Maine, New Hampshire, New York and Vermont. *U.S. Federal Emergency Management Agency, Washington, D.C.*, Feb. 1998, 31p. + appends., PB98-143290.

Ice storms, Accidents, Cost analysis, Rescue operations, Cold weather operation, Regional planning, United States—Maine, United States—New Hampshire, United States—New York, United States—Vermont

## 53-4315

**Time series analyses of climatological records from Auke Bay, Alaska.**

Wing, B.L., Pella, J.J., *U.S. National Oceanic and Atmospheric Administration. National Marine Fisheries Service. Alaska Fisheries Science Center. Technical memorandum*, June 1998, NOAA-TM-NMFS-AFSC-91, 90p., PB98-149206, 35 refs.

Weather stations, Meteorological data, Air temperature, Surface temperature, Precipitation (meteorology), Snowfall, Freezup, Ice breakup, Marine meteorology, Statistical analysis, United States—Alaska—Auke Bay

## 53-4316

**Storage and preservation of soil samples for volatile compound analysis.**

Hewitt, A.D., SR 99-05, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, May 1999, 21p., ADA-363 601, 22 refs.

Cold storage, Soil tests, Soil analysis, Chemical analysis, Soil pollution, Soil chemistry, Preserving, Storage

Traditionally, soil samples obtained for characterizing or monitoring sites for volatile organic compounds (VOCs) have been transported off site before initiating the preparation steps necessary for analysis. In the most recent regulatory guidance, only a two-day holding period at 4±2°C is recommended before a sample should be preserved, so as to allow storage up to 14 days prior to instrumental analysis. The transportation and storage of soil samples were evaluated for (1) covered core barrel liners, (2) En Core samplers and (3) empty volatile organic analysis (VOA) vials under different conditions. Core barrel liners covered with either of two formulations of Teflon sheeting or aluminum foil failed to prevent rapid losses of VOCs. En Core samplers and otherwise empty VOA vials were suitable transportation and storage chambers for samples. These chambers not only meet the initial requirement to retain VOCs for two days when held at 4±2°C for transportation purposes, but frequently showed no significant loss of VOCs after placing in a freezer and storing at -12±3°C for an additional 12 days.

## 53-4317

**Effects of temperature and substrate quality on element mineralization in six arctic soils.**

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Tundra vegetation, Vegetation patterns, Plant ecology, Tundra soils, Soil microbiology, Nutrient cycle, United States—Alaska—North Slope

## 53-4318

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Tundra vegetation, Vegetation patterns, Plant ecology, Growth, Nutrient cycle, Biomass, United States—Alaska—Toolik Lake

## 53-4319

**Chronology of vegetation and paleoclimatic stages of northwestern Russia during the Late Glacial and Holocene.**

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Peat, Lacustrine deposits, Palynology, Paleobotany, Plant ecology, Vegetation patterns, Soil dating, Paleoclimatology, Russia—Novgorod, Russia—St. Petersburg, Russia—Karelia

## 53-4320

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Ice surveys, Sea ice distribution, Ice conditions, Ice detection, Radio echo soundings, Spaceborne photography, Image processing, Data processing

## 53-4321

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Roofs, Snow depth, Snow loads

## 53-4322

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Vaganov, E.A., Hughes, M.K., Kirdianov, A.V., Schweingruber, F.H., Silkin, P.P., *Nature*, July 8, 1999, 400(6740), p.149-151, 24 refs.

Snowfall, Snow melting, Snow cover effect, Phenology, Trees (plants), Plant ecology, Plant physiology, Growth, Climatic changes, Russia

## 53-4323

**Distortion of isochronous layers in ice revealed by ground-penetrating radar.**

Vaughan, D.G., Corr, H.F.J., Doake, C.S.M., Waddington, E.D., *Nature*, Mar. 25, 1999, 398(6725), p.323-326, 27 refs.

Ice sheets, Glacier flow, Snow ice interface, Snow stratigraphy, Firm stratification, Glacier ice, Ice structure, Radio echo soundings, Electromagnetic prospecting, Antarctica—Fletcher Ice Rise

## 53-4324

**Topography of the lunar poles from radar interferometry: a survey of cold trap locations.**

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Moon, Topographic surveys, Extraterrestrial ice, Ice detection

## 53-4325

**Abstracts.**

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Ice surveys, Sea ice distribution, Ice conditions, Ice cover thickness, Ice cover effect, Ice water interface, Ice friction, Ice pileup, Ice loads, Offshore structures, Okhotsk Sea

## 53-4326

**Primary production and seasonal sea ice in Saroma-ko Lagoon.**

Kato, C., Hattori, H., Saito, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.10-12, 2 refs.

Ice conditions, Ice cover effect, Marine biology, Algae, Plankton, Biomass, Japan—Hokkaido

## 53-4327

**Initial incorporation of phytoplankton to the sea ice in Saroma-ko Lagoon, Hokkaido, Japan.**

Niimura, Y., Ishimaru, T., Taguchi, S., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.13-19, 26 refs.

Sea ice, Ice composition, Ice water interface, Ice cover effect, Marine biology, Cryobiology, Biomass, Algae, Plankton, Ecology, Japan—Hokkaido

## 53-4328

**Parametrization of ice categories in a coupled ice-ocean model. [Kaihyo kategori no parameterizashon ga kaihyo no seicho, missetsudo ni kangaeru eikyo ni kansuru kenkyu]**

Shinkai, H., Ikeda, M., Watanabe, T., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999.

Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.47-52, In Japanese with English summary. 5 refs.

Sea ice distribution, Ice cover thickness, Ice conditions, Sea water freezing, Ice formation, Ice growth, Ice heat flux, Air ice water interaction, Ice models, Mathematical models

## 53-4329

**Interannual variations of sea ice types and relationships with air temperature in the Sea of Okhotsk during 1988-1997.**

Tateyama, K., Enomoto, H., Shirasaki, K., Nishio, F., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.53-57, 6 refs.

Ice surveys, Sea ice distribution, Ice detection, Ice conditions, Ice edge, Air temperature, Climatic changes, Radiometry, Spaceborne photography, Okhotsk Sea

## 53-4330

**Sea ice observations in the Sea of Okhotsk and the Tatarskiy Strait by NOAA imagery example-1. [NOAA gazo ni yoru Ohotsuku-kai to Mamiya kaikyo no kaihyo kansoku rei-1]**

Ishida, K., Seko, F., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.58-66, In Japanese with English summary and captions. 13 refs.

Ice surveys, Sea ice distribution, Ice conditions, Drift, Polynyas, Radiometry, Spaceborne photography, Russia—Tatar Strait

## 53-4331

**Long-term sea ice monitoring in the Sea of Okhotsk and polar regions. [Ohotsuku-kai oyobi zenkyu no kaihyo menseki hendo ni tsuite]**

Iwao, T., Taguchi, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.67-70, In Japanese with English summary and captions.

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Global change, Spaceborne photography, Okhotsk Sea

## 53-4332

**Preliminary study on sea ice observation using a ship-borne laser altimeter.**

Uto, S., Shimoda, H., Oka, S., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.72-77, 6 refs.

Ice surveys, Ships, Ice navigation, Sea ice, Ice cover thickness, Ice surface, Pressure ridges, Snow ice interface, Height finding, Lidar, Okhotsk Sea, Japan—Hokkaido

## 53-4333

**Strategy for evaluating the role of seasonal sea-ice formation in the ventilation of the abyssal Japan/East Sea: using dissolved noble gas concentration anomalies.**

Postlethwaite, C.F., Shirasawa, K., Jenkins, W.J., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.78-83, 14 refs.

Sea water freezing, Ice formation, Ice heat flux, Ice water interface, Ice cover effect, Water temperature, Salinity, Aeration, Ocean currents, Water transport, Global change, Japan, Sea

## 53-4334

**Measurements of under-ice currents and turbulent fluxes of momentum and heat in the North Water (NOW) polynya region.**

Shirasawa, K., Kobinata, K., Takatsuka, T., Kawamura, T., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.85-89.

Oceanographic surveys, Ice water interface, Ice cover effect, Polynyas, Ocean currents, Water transport, Water temperature, Salinity, Baffin Bay

## 53-4335

**Measurements of under-ice turbulent fluxes and oceanic boundary layer processes in the Baltic Sea—BALTEX/BASIS 1998 experiment.**

Shirasawa, K., Kobinata, K., Takatsuka, T., Kawamura, T., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.90-94.

Fast ice, Ice water interface, Ice heat flux, Oceanographic surveys, Ocean currents, Water transport, Water temperature, Salinity, Baltic Sea

## 53-4336

**Sea ice as a storage and transportation agent of sedimentary matter in the Baltic Sea—some implications.**

Granskog, M., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.95-99, 10 refs.

Ice composition, Impurities, Ice rafting, Suspended sediments, Sediment transport, Ice water interface, Water pollution, Baltic Sea

## 53-4337

**Lagrangian simulation of mesoscale ice dynamics.**

Shen, H.T., Wang, Z.L., Wu, H.D., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999.

Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.100-105, 18 refs.

Sea ice distribution, Ice conditions, Ice cover thickness, Ice edge, Drift, Ice forecasting, Ice models, Mathematical models, Computerized simulation, China—Bohai Sea

## 53-4338

**Growth of a pancake ice cover in a wave field.**

Shen, H.H., Leonard, G.H., Ackley, S.F., MP 5360, International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.106-111, 7 refs.

Sea water freezing, Frazil ice, Ice formation, Ice growth, Ice water interface, Ice cover effect, Ocean waves, Air temperature, Water temperature, Air ice water interaction

Experimental results of pancake ice growth and the associated wave field evolution are presented. From these results, a conceptual theory that describes natural growth of pancake ice in a wave field is suggested. Three experiments were conducted in two laboratory wave tanks in Jan. 1995, 1996 and Feb. 1997. In these experiments, various wave conditions, some with wind and current, were generated. The observed parameters were the ice cover and the wave amplitude

evolutions. It is found that ice cover morphology is sensitively dependent on both the wave spectrum and the air and water temperatures.

## 53-4339

**Investigation of diamond dust crystals at various locations. [Daiyamondo dasuto no kenkyu]**

Ohtake, T., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.112-114, In Japanese with English summary. 16 refs.

Ice fog, Ice crystal growth, Ice nuclei, Ice crystal replicas

## 53-4340

**Preliminary simulation study of a cargo vessel along the NSR. [Hyokai koko shimyureshon—Hokkyokukai koro ni okeru shikaisan]**

Ozeki, T., Kitagawa, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.115-122, In Japanese with English summary. 3 refs.

Ice conditions, Ice navigation, Ice routing, Route surveys, Ships, Icebreakers, Computerized simulation, Northern Sea Route

## 53-4341

**Application of GIS to study on Northern Sea Route. [Hyokkokukai koro chosa ni okeru GIS no katsuyou]**

Yamauchi, Y., Kamesaki, K., Shiraki, A., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.123-129, In Japanese with English summary. 3 refs.

Ice surveys, Sea ice distribution, Ice cover thickness, Ice conditions, Route surveys, Ice navigation, Ice routing, Data processing, Northern Sea Route

## 53-4342

**Method for selecting subsea pipeline route under ice conditions (for the Sakhalin offshore case).**

Polomoshnov, A.M., Astaf'ev, V.N., Surkov, G.A., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.130-136, 13 refs.

Underground pipelines, Pipe laying, Route surveys, Ocean bottom, Bottom topography, Ice scoring, Pressure ridges, Hummocks, Grounded ice, Russia—Sakhalin Island, Okhotsk Sea

## 53-4343

**Application of oil recovery equipment in cold waters. [Kison no yukaishu, shori gjutsu no kanrei kaikai e no tekiyo]**

Fujii, S., Ueda, K., Yamanouchi, H., Maeda, T., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.137-142, In Japanese with English summary.

Oil spills, Oil recovery, Water pollution, Interfacial tension, Viscosity

## 53-4344

**Preparedness for oil spills in pack ice. [Ryuhyo iki abura osen no kanosei to taisaku ni tsuite]**

Narita, S., Yamaguchi, H., Arita, M., Tamura, K., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.143-148, In Japanese with English summary. 16 refs.

Oil spills, Water pollution, Ice water interface, Ice cover effect, Oil recovery, Environmental protection, Okhotsk Sea

## 53-4345

**Friction-wear characteristics of paint coating films at frozen sea. [Tomaku no masatsu, mamotokusei]**

Kitamura, S., et al, International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.149-155, In Japanese with English summary. 6 refs.

Offshore structures, Ships, Protective coatings, Ice solid interface, Ice friction, Abrasion, Hardness tests

## 53-4346

**Design methods for the facility preventing from overtopping of ice floes. [Eppyo boshi shisetsu ni sayo suru hyo kaju no hyoka to shisekkei]**

Ishikawa, H., Kawai, K., Sato, M., Hayakawa, T., Watanabe, Y., Saeki, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.156-161, In Japanese with English summary. 2 refs.

Ports, Offshore structures, Ice push, Ice pileup, Ice loads, Ice control, Ocean waves, Impact tests

## 53-4347

**Experimental study on the fluid resistance of ice jam. [Aisujamu kelsel-ji no fuhyo bangun ni sayo suru ryutairyoku]**

Makita, S., Kawai, T., Hara, F., Enoki, K., Saeki, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.162-167, In Japanese with English summary. 2 refs.

Ice jams, Ice floes, Ice water interface, Ice friction, Ice pileup, Ice loads, Ice booms

## 53-4348

**Movement of ice floes at the edge of ice sheets in Saroma Lagoon. [Saroma-ko nai kepppyoban hyoenbu ni okeru ryunyu ryuhyo no undo ni kansuru kenkyu]**

Makita, S., Oshima, K., Kawai, T., Hara, F., Enoki, K., Saeki, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.168-175, In Japanese with English summary. 5 refs.

Ports, Ice floes, Drift, Ice friction, Ice pileup, Ice loads, Ice booms, Ice control, Japan—Hokkaido

## 53-4349

**Stability of armor stones on doubly placed submerged breakwater due to ice floes in wave field and behavior of ice floes near the breakwaters. [Niju sentei kinbo no ryuhyo no undo to sentei zairoyo no antelisei]**

Ishikawa, H., Kitamura, T., Sato, M., Hayakawa, T., Watanabe, Y., Saeki, H., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.176-182, In Japanese with English summary. 4 refs.

Ports, Offshore structures, Artificial islands, Embankments, Rock fills, Ice floes, Drift, Ice pileup, Ice loads, Ice friction, Ice control

## 53-4350

**Concentration and quantity of methane surfacing from a lake bottom and contained in bubbles within ice over lakes.**

Toukairin, A., Fukuda, M., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.219-224.

Wetlands, Frozen lakes, Lacustrine deposits, Bottom sediment, Lake ice, Ice composition, Bubbles, Ice cover effect, Ice air interface, Nutrient cycle, Geochemical cycles, Japan—Hokkaido

## 53-4351

**Tidal transformation of Okhotsk Sea waters in the Friza and Ekaterina Straits.**

Bobkov, A.A., Foux, V.R., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.225-230, 3 refs.

Oceanographic surveys, Tidal currents, Sea water, Water transport, Water temperature, Okhotsk Sea, Russia—Kurul Islands

## 53-4352

**Laser optoacoustic diagnostics of sea ice.**

Maksimov, A.O., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.234-239, 12 refs.

Ice cover thickness, Ice detection, Ice water interface, Ice optics, Ice acoustics, Lasers, Lidar, Soundings, Underwater acoustics, Wave propagation, Mathematical models

## 53-4353

**Level and ice jams in the Amur Liman.**

IAkunin, L.P., International Symposium on Okhotsk Sea and Sea Ice, 14th, Mombetsu, Hokkaido, Japan, Jan. 31-Feb. 4, 1999. Abstracts, Mombetsu, Okhotsk Sea and Cold Ocean Research Association, 1999, p.240-241, 1 ref.

Estuaries, River ice, Ice breakup, Ice jams, Ice cover effect, Ice water interface, River flow, Water level, Russia—Amur River, Russia—Tatar Strait

## 53-4354

**Persistence of the Cassubian Littoral meltwater channels. [Przetwórczość pradolin Półwyspu Kaszubskiego]**

Rachocki, A., *Uniwersytet Gdański. Zeszyty naukowe geografii*, 1992, No.18, p.97-118, In Polish with English summary. 16 refs.

DLC G1.D13 18th 1992

Paleoclimatology, Pleistocene, Terraces, Geomorphology, Glacial geology, Glaciation, Glacier melting, Theories, Stream flow, Runoff, Glacial rivers, Valleys, Poland—Leba River

## 53-4355

**On soil-moisture studies in the Elbląg Delta Plain during the thaw period. [Z badań nad wilgotnością gleby na Żuławach Elbląskich w okresie roztopowym]**

Bogdanowicz, R., *Uniwersytet Gdański. Zeszyty naukowe geografii*, 1992, No.18, p.119-131, In Polish with English summary. 12 refs.

DLC G1.D13 18th 1992

Deltas, Plains, Water table, Ground thawing, Soil water, Water content, Snow cover effect, Snowmelt, Soil profiles, Snow depth, Vegetation factors, Poland

## 53-4356

**Changes in the Triglav Glacier in the 1955-1994 period in the light of climatic indicators. [Spremembe na Triglavskem ledeniku 1955-1994 v luči klimatskih pokazateljev]**

Gams, I., *Geografski zbornik. Acta geographica*, 1994, No.34, p.81-117, In English and Slovenian. 31 refs.

DLC G1.G3148 34 1994

Glacier oscillation, Glacier ablation, Mountain glaciers, Insolation, Temperature effects, Precipitation (meteorology), Snow cover effect, Glacier mass balance, Climatic factors, Glacier beds, Bedrock, Slovenia

## 53-4357

**Energy budget approach to urban snow deposit melt.**

Sundin, E., Andreasson, P., Viklander, M., *Nordic hydrology*, 1999, 30(1), p.39-56, 29 refs.

Snow disposal, Snow melting, Forecasting, Mathematical models, Snowmelt, Latent heat, Heat transfer, Snow air interface, Degree days, Runoff, Sweden

## 53-4358

**Wind-induced precipitation undercatch of the Hellmann gauges.**

Yang, D.Q., et al, *Nordic hydrology*, 1999, 30(1), p.57-80, 42 refs.

Precipitation gages, Accuracy, Performance, Precipitation (meteorology), Rain, Snowfall, Wind velocity, Air temperature, Russia, Finland, Germany, Croatia

## 53-4359

**Arctic snow cover information for hydrological investigations at various scales.**

Woo, M.K., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.245-266, Refs. p.263-266.

Snow cover distribution, Hydrologic cycle, Precipitation gages, Accuracy, Data processing, Snow surveys, Snow survey tools, Remote sensing, Snow samplers, Snowfall, Snow cover effect, Snowdrifts, Snow hydrology, Snow water equivalent, Models, Slopes, Canada

## 53-4360

**Fluxes of water and energy from three high latitude tundra sites in Svalbard.**

Harding, R.J., Lloyd, C.R., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.267-284, 18 refs.

Tundra, Rain, Evaporation, Heat flux, Snow depth, Snowmelt, Latent heat, Solar radiation, Albedo, Air temperature, Norway—Svalbard

## 53-4361

**Modelling snowmelt induced waste water inflows.**

Semadeni-Davies, A., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.285-302, 29 refs.

Models, Snowmelt, Snow cover, Waste treatment, Snow water equivalent, Drainage, Seepage, Snow hydrology, Snow impurities, Sweden

## 53-4362

**Evapotranspiration from a wetland complex on the arctic coastal plain of Alaska.**

Mendez, J., Hinzman, L.D., Kane, D.L., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.303-330, Refs. p.327-329.

Wetlands, Evapotranspiration, Heat flux, Latent heat, Watersheds, Tundra, Ponds, Data processing, Mathematical models, Water balance, Statistical analysis, Evaporation, United States—Alaska—Prudhoe Bay

## 53-4363

**Snowmelt hydrology of two subarctic slopes, southern Yukon, Canada.**

Carey, S.K., Woo, M.K., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.331-346, 20 refs.

Snow hydrology, Snowmelt, Slope processes, Snow melting, Soil water, Runoff, Soil temperature, Snow cover effect, Isotherms, Seepage, Canada—Yukon Territory—Whitehorse, United States—Alaska—North Slope

## 53-4364

**Contributions of snow to the annual water balance in Moshiri Watershed, northern Hokkaido, Japan.**

Ishikawa, N., Nakabayashi, H., Ishii, Y., Kodama, Y., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.347-360, 15 refs.

Watersheds, Heat balance, Heat flux, Solar radiation, Water balance, Snow melting, Snow depth, Snow surface, Forest land, Climatic factors, Forecasting, Snow cover effect, Snowmelt, Japan—Hokkaido

## 53-4365

**Application of georadar for snow cover surveying.**

Sand, K., Bruland, O., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.361-370, 11 refs.

Snow cover distribution, Snow surveys, Snow water equivalent, Data processing, Radar echoes, Snow depth, Snow density, Snow courses, Norway

## 53-4366

**Effects of frozen soils on groundwater recharge and discharge in granitic rock terrane of the Canadian Shield.**

Thorne, G.A., Laporte, J., Clarke, D., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.371-384, 11 refs.

Ground water, Seepage, Wetlands, Frozen ground temperature, Frozen ground thermodynamics, Bedrock, Subsurface drainage, Frozen ground mechanics

## 53-4367

**Subpermafrost groundwater modelling in Ny-Ålesund, Svalbard.**

Booij, M., Leijnse, A., Haldorsen, S., Heim, M., Rueslatten, H., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.385-396, 14 refs.

Computerized simulation, Models, Subpermafrost ground water, Mapping, Permafrost thickness, Bedrock, Glacial geology, Water flow, Heat transfer, Norway—Svalbard

## 53-4368

**Sediment bound contaminants in a remote northern delta.**

Milburn, D., Prowse, T.D., *Nordic hydrology*, 1998, 29(4/5), Northern Research Basins Symposium/Workshop, 11th, Prudhoe Bay to Fairbanks, AK, Aug. 18-22, 1997. Selected papers, p.397-414, Refs. p.411-414.

Deltas, Alluvium, Sediment transport, River ice, Water pollution, Ice cover effect, Channels (waterways), Freezeup, Ice breakup, Soil pollution, Canada—Northwest Territories—Slave River Delta

## 53-4369

**Earth dams with concrete and reinforced-concrete core walls.**

IAgin, V.P., Davydov, I.A., Mik, V.V., Leimann, T.V., *Hydrotechnical construction*, Feb. 1998(Pub. Aug.98), 32(2), p.70-75, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 11 refs.

Earth dams, Walls, Reinforced concretes, Cold weather performance, Design

## 53-4370

**Theoretical basis of designing concrete dams with consideration of construction operations.**

Erakhtin, B.M., *Hydrotechnical construction*, Feb. 1998(Pub. Aug.98), 32(2), p.82-88, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 6 refs.

Design, Design criteria, Dams, Concrete structures, Winter concreting, Cold weather construction

## 53-4371

**Clay minerals in the sediments of Lake Baikal: a useful climate proxy.**

Yuretic, R., Melles, M., Sarata, B., Grobe, H., *Journal of sedimentary research A*, May 1999, 69(3), p.588-596, 40 refs.

Lacustrine deposits, Bottom sediment, Clay minerals, Soil dating, Stratigraphy, Drill core analysis, Paleoclimatology, Russia—Baykal, Lake

## 53-4372

**Compositional variations and provenance of Triassic sandstones from the Barents Shelf.**

Mørk, M.B.E., *Journal of sedimentary research A*, May 1999, 69(3), p.690-710, Refs. p.704-706.

Marine geology, Marine deposits, Bottom sediment, Mineralogy, Sea level, Geological surveys, Stratigraphy, Geochronology, Barents Sea



## 53-4373

Newly discovered cap carbonate above Varanger-age glacial deposits in Newfoundland, Canada.

Myrow, P.M., Kaufman, A.J., *Journal of sedimentary research A*, May 1999, 69(3), p.784-793, 74 refs.

Glacial geology, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Glaciation, Sea level, Tectonics, Continental drift, Geochronology, Canada—Newfoundland—Avalon Peninsula

## 53-4374

Hartree-Fock and DFT calculations of quadrupole coupling constants in water clusters and ice. Alfredsson, M., Hermansson, K., *Chemical physics*, Apr. 1, 1999, 242(2), p.161-175, 59 refs.

Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, High pressure ice, Ice crystal structure

## 53-4375

Krasnoyarsk Hydroelectric Station: 30 years in operation.

Boiarskii, V.M., Grigor'ev, I.U.A., Kolmogorov, V.V., Aleksandrovskaya, E.K., *Hydrotechnical construction*, Aug. 1997(Pub. Feb.98), 31(8), p.464-467, Translated from *Gidrotekhnicheskoe stroitel'stvo*.

Electric power, Cold weather operation, Design, Hydraulic structures, Russia—Krasnoyarsk

## 53-4376

Construction of the Vilyul-3 hydroelectric station. Tsvik, A.M., Sherman, M.M., Toloshinov, A.V., *Hydrotechnical construction*, Aug. 1997(Pub. Feb.98), 31(8), p.484-488, Translated from *Gidrotekhnicheskoe stroitel'stvo*.

Electric power, Hydraulic structures, Design, Design criteria, Cold weather performance, Cold weather construction, Russia—Vilyuy River

## 53-4377

Underground structures.

Kuznetsov, R.I.A., Gevirts, G.I.A., *Hydrotechnical construction*, Aug. 1997(Pub. Feb.98), 31(8), p.505-512, Translated from *Gidrotekhnicheskoe stroitel'stvo*.

Electric power, Hydraulic structures, Underground facilities, Subsurface structures, Design, Cold weather construction, Cold weather performance, Reinforced concretes, Tunnels, Russia—Kolyma River

## 53-4378

Experimental measurement and calculation of the thermal conductivity of clay-and-polystyrene-filled concretes.

Ivanov, V.A., Stepanov, A.V., Timofeev, A.M., *Journal of engineering physics and thermophysics*, July-Aug. 1998(Pub. Feb.99), 71(4), p.727-730, Translated from *Inzhenerno-fizicheskii zhurnal*. 9 refs.

Thermal conductivity, Cold weather performance, Mathematical models, Lightweight concretes, Thermal insulation, Polymers, Concrete admixtures, Russia—Far North

## 53-4379

Ozone measurements in the European Arctic during the ARCTOC 1995 campaign.

Lorenzen-Schmidt, H., et al, *Tellus*, Nov. 1998, 50B(5), p.416-429, 21 refs.

Polar atmospheres, Atmospheric composition, Ozone, Air masses, Temperature inversions, Norway—Svalbard

## 53-4380

Ozone and C<sub>2</sub>-C<sub>5</sub> hydrocarbon observations in the marine boundary layer between 45°S and 77°S.

Gros, V., et al, *Tellus*, Nov. 1998, 50B(5), p.430-448, Refs. p.445-448.

Ozone, Hydrocarbons, Polar atmospheres, Air pollution, Stratosphere, Air water interactions, Atmospheric composition, Atmospheric circulation, Antarctica—Ross Sea, New Zealand

## 53-4381

Analysis of the growth of nucleation mode particles observed in boreal forest.

Kulmala, M., Toivonen, A., Mäkelä, J.M., Laaksonen, A., *Tellus*, Nov. 1998, 50B(5), p.449-462, 31 refs.

Taiga, Forest land, Forest ecosystems, Atmospheric composition, Air pollution, Aerosols, Condensation nuclei, Finland

## 53-4382

Characteristics of modern atmospheric dust deposition in snow on the Penny Ice Cap, Baffin Island, Arctic Canada.

Zdanowicz, C.M., Zielinski, G.A., Wake, C.P., *Tellus*, Nov. 1998, 50B(5), p.506-520, 52 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Dust, Scavenging, Snow composition, Snow ice interface, Snow impurities, Snow samplers, Ice dating, Canada—Northwest Territories—Baffin Island

## 53-4383

Multilingual vocabulary—snow and avalanches. [Večjezični slovar—sneg in plazovi]

Segula, P., Ljubljana, Gorska reševalna služba pri Planinski zvezi Slovenije, 1995, 360p., In Slovenian, English, French, German, Italian and Spanish. 51 refs. DLC GB2405.S44 1995

Dictionaries, Snow, Avalanches, Terminology

## 53-4384

Low-temperature chemistry of the atmosphere.

Moortgat, G.K., ed, Barnes, A.J., ed, Le Bras, G., ed, Sodeau, J.R., ed, North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I: Global environmental change, Vol.21, Berlin, Springer-Verlag, 1994, 544p., Refs. passim. Based on lectures presented at the NATO Advanced Study Institute on Low-Temperature Chemistry of the Atmosphere, Maratea, Italy, Aug. 29-Sep. 11, 1993. For individual papers see 49-3228 through 49-3238 and 53-4385 through 53-4395.

DLC QC879.6.L69 1994

Atmospheric composition, Cloud physics, Ozone, Polar atmospheres, Polar stratospheric clouds, Aerosols, Heterogeneous nucleation, Photochemical reactions

## 53-4385

Atmospheric chemistry: introduction.

Wayne, R.P., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.1-20, 19 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Air pollution, Ozone, Photochemical reactions, Planetary environments, Atmospheric physics, Global warming

## 53-4386

Clouds, rain and aerosols.

Warneck, P., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.49-68, 22 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Cloud physics, Aerosols, Supersaturation, Condensation nuclei, Homogeneous nucleation, Heterogeneous nucleation, Precipitation (meteorology), Rain

## 53-4387

Gas phase homogeneous kinetics.

Golden, D.M., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.69-92, 29 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Homogeneous nucleation, Molecular structure, Molecular energy levels, Phase transformations, Mathematical models

## 53-4388

Laboratory kinetics at low temperature.

Le Bras, G., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.93-110, 18 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Ozone, Molecular structure, Molecular energy levels, Low temperature research

## 53-4389

Atmospheric photochemistry and spectroscopy.

Weaver, A., Ravishankara, A.R., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.111-145, 30 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Photochemical reactions, Ozone, Lidar, Molecular structure, Molecular energy levels

## 53-4390

Aqueous solution chemistry.

Warneck, P., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.175-196, 27 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Cloud physics, Cloud droplets, Condensation nuclei, Liquid phases, Molecular structure, Molecular energy levels

## 53-4391

Surface chemistry.

Chesters, M.A., Horn, A.B., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.219-233, 17 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Ice vapor interface, Surface energy, Adsorption, Molecular structure, Molecular energy levels

## 53-4392

Chemistry in sulfate aerosols.

Ravishankara, A.R., Hanson, D.R., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.287-306, 30 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Polar stratospheric clouds, Cloud physics, Aerosols, Ice nuclei, Heterogeneous nucleation, Ozone

## 53-4393

Cryogenic sampling techniques.

Moortgat, G.K., Griffith, D.W.T., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.389-419, 63 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Stratosphere, Balloons, Meteorological instruments, Cryogenics, Chemical analysis

53-4394

**Global tropospheric chemistry.**

Crutzen, P.J., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.465-498, 55 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Atmospheric circulation, Air pollution, Photochemical reactions, Ozone, Global warming

53-4395

**Modelling the chemistry and micro-physics of the cold stratosphere.**

Peter, T., Crutzen, P.J., Low-temperature chemistry of the atmosphere. North Atlantic Treaty Organization. Advanced Science Institutes. NATO ASI Series I, Vol.21. Edited by G.K. Moortgat, A.J. Barnes, G. Le Bras, and J.R. Sodeau, Berlin, Springer-Verlag, 1994, p.499-530, 45 refs.

DLC QC879.6.L69 1994

Atmospheric composition, Atmospheric circulation, Stratosphere, Polar stratospheric clouds, Cloud physics, Global warming, Mathematical models, Computerized simulation

53-4396

**Glacier hydrology and hydrochemistry.**

Sharp, M., ed, Richards, K.S., ed, Tranter, M., ed, Advances in hydrological processes, Chichester, UK, John Wiley & Sons Ltd., 1998, 342p., Refs. passim. For individual papers see 49-3708, 50-6083 through 50-6092, 51-4823, 51-4825, 51-4830, 52-5642 through 52-5643 and 53-1050.

DLC GB2404.G54 1998

Hydrology, Glaciology, Water chemistry, Drainage, Snow hydrology, Meltwater, Glacial hydrology, Run-off, Subglacial drainage, Subglacial observations, Ablation, Mountain glaciers, Boreholes

53-4397

**Risk assessment in cold environment.**

Holmér, I., *Barents*, 1998, 1(3), p.77-79, 93-96, In English and Russian. 16 refs.

Human factors, Cold stress, Health, Cold weather survival, Safety, Wind chill

53-4398

**Work in the cold: a review of Russian experience in the North.**

Chashchin, V., *Barents*, 1998, 1(3), p.80-82, 97-99, In English and Russian. 4 refs.

Human factors, Cold stress, Health, Cold weather survival, Safety, Labor factors, Temperature effects, Russia—Far North

53-4399

**Dual role of skeletal muscles in the cold.**

Meigal, A.I.U., *Barents*, 1998, 1(3), p.82-83, 100-101, In English and Russian. 8 refs.

Health, Human factors, Cold weather survival, Labor factors, Temperature effects

53-4400

**Human performance in cold.**

Rintamäki, H., *Barents*, 1998, 1(3), p.84-85, 101-102, In English and Russian. 6 refs.

Health, Safety, Human factors, Labor factors, Clothing, Cold weather performance, Temperature effects

53-4401

**Heart rate variability method for estimating the response of the human organism in cold: a pilot experiment by Russian "Kardioanalizator VR" in the climatic chamber of ORIOH.**

Vlassova, E., Chernouss, S., Vinogradov, A., Rintamäki, H., *Barents*, 1998, 1(3), p.88-90, 103-104, In English and Russian. 7 refs.

Health, Safety, Human factors, Cold stress, Low temperature tests, Measuring instruments, Temperature effects

53-4402

**Wind and cold have a joint effect on cooling.**

Anttonen, H., Hiltunen, E., *Barents*, 1998, 1(3), p.90-92, 105-107, In English and Russian.

Health, Cold stress, Human factors, Wind chill, Labor factors, Clothing, Wind factors, Thermal insulation, Frostbite, Temperature effects

53-4403

**Fate of <sup>15</sup>N-labelled fertilizer applied to corn grown on different soil types.**

Tran, T.S., Giroux, M., *Canadian journal of soil science*, Nov. 1998, 78(4), p.597-605, With French summary. 40 refs.

Agriculture, Soil chemistry, Soil profiles, Precipitation (meteorology), Snow accumulation, Nutrient cycle, Snowmelt, Environmental impact, Leaching, Canada—Quebec

53-4404

**Comparison of porosity in a Chernozemic clay loam soil under long-term conventional tillage and no-till.**

Miller, J.J., Kokko, E.G., Kozub, G.C., *Canadian journal of soil science*, Nov. 1998, 78(4), p.619-629, With French summary. 47 refs.

Agriculture, Chernozem, Porosity, Soil water, Microstructure, Loams, Freeze thaw cycles, Canada—Alberta

53-4405

**Runoff and sediment yield from snowmelt and rainfall as influenced by forage type and grazing intensity.**

Gill, S.I., Naeth, M.A., Chanasyk, D.S., Baron, V.S., *Canadian journal of soil science*, Nov. 1998, 78(4), p.699-706, With French summary. 32 refs.

Snowmelt, Runoff, Grazing, Soil erosion, Soil conservation, Rain, Sediments, Biomass, Litter, Simulation, Grasses, Canada—Alberta

53-4406

**Measurement of ice growth and melt in the Labrador pack ice.**

Belliveau, D.J., Tang, C.L., Mahon, A.M., *International journal of offshore and polar engineering*, Mar. 1999, 9(1), p.62-67, 3 refs.

Ice surveys, Ice conditions, Ice cover thickness, Thickness gages, Telemetering equipment, Data transmission, Pack ice, Canada—Labrador

53-4407

**Application of the pivot point on the FCP diagram to low-temperature fatigue of materials.**

Duan, M.L., Li, J.C.M., Li, J., *International journal of offshore and polar engineering*, Mar. 1999, 9(1), p.68-72, 18 refs. For another version see 51-5743.

Offshore structures, Steel structures, Steels, Low temperature tests, Cold stress, Fatigue (materials), Crack propagation, Mathematical models

53-4408

**Threat of the snow avalanches. [Ogroženost zaradi snežnih plazov]**

Gams, I., Naravne nesreče v Sloveniji kot naša ogroženost (Natural disasters in Slovenia as a threat), edited by I. Gams, Ljubljana, Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti, 1983, p.75-82, In Slovenian with English summary. 3 refs.

DLC GB5011.67.N37 1983

Avalanches, Avalanche protection, Countermeasures, Avalanche forecasting, Slovenia—Alps

53-4409

**Threat of the freezing and frost. [Nevarnost pozebe in mraza]**

Zrnc, C., Turk, M., Naravne nesreče v Sloveniji kot naša ogroženost (Natural disasters in Slovenia as a threat), edited by I. Gams, Ljubljana, Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti, 1983, p.83-93, In Slovenian with English summary. 20 refs.

DLC GB5011.67.N37 1983

Agriculture, Air temperature, Plant physiology, Frost resistance, Plant tissues, Wind factors, Advection, Evaporation, Temperature effects, Damage, Frost action, Slovenia

53-4410

**Climatic disasters, their frequency and effects in the Slovene forests. [Ujme, njihova pogostost in škoda v slovenskih gozdovih]**

Bleiweis, S., Naravne nesreče v Sloveniji kot naša ogroženost (Natural disasters in Slovenia as a threat), edited by I. Gams, Ljubljana, Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti, 1983, p.101-106, In Slovenian with English summary. 29 refs.

DLC GB5011.67.N37 1983

Damage, Forest strips, Glaze, Snow cover effect, Wind factors, Trees (plants), Ice storms, Ice loads, Frost action, Slovenia

53-4411

**Intensive glaze frosts in Slovenia. [Zledne ujme v Sloveniji]**

Radinja, D., Naravne nesreče v Sloveniji kot naša ogroženost (Natural disasters in Slovenia as a threat), edited by I. Gams, Ljubljana, Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti, 1983, p.107-115, In Slovenian with English summary. 26 refs.

DLC GB5011.67.N37 1983

Glaze, Damage, Ice storms, Frost action, Agriculture, Ice loads, Trees (plants), Power line icing, Topographic effects, Transmission lines, Slovenia

53-4412

**Threat of hail in Slovenia. [Ogroženost Slovenije zaradi toče]**

Kranjc, A., Naravne nesreče v Sloveniji kot naša ogroženost (Natural disasters in Slovenia as a threat), edited by I. Gams, Ljubljana, Geografski inštitut Antona Melika Znanstvenoraziskovalnega centra Slovenske akademije znanosti in umetnosti, 1983, p.116-125, In Slovenian with English summary. 4 refs.

DLC GB5011.67.N37 1983

Hail, Hailstone growth, Damage, Agriculture, Economic analysis, Slovenia

53-4413

**Glaciotectionic elements in the relief and geological structure near Łódź, Central Poland. [Elementy glacytektoniczne w budowie geologicznej i rzeźbie podłoża części środkowej Polski]**

Klatkova, H., *Łódzkie Towarzystwo Naukowe. Acta geographica Łodziensia*, 1996, No.72, Przejawy glacytektoniki w Polsce środkowej (Glaciotectionic symptoms in central Poland), edited by H. Klatkova, p.7-103, In Polish with English summary. 62 refs.

DLC GB588.68.P7P78 1996

Tectonics, Geomorphology, Structural analysis, Glacial deposits, Glacial geology, Glacial till, Quaternary deposits, Topographic features, Pleistocene, Clays, Glacial erosion, Deformation, Paleoclimatology, Poland—Łódź

53-4414

**Examples of glaciotectionic structures in Celestynów near Łódź. [Przykłady struktur glacytektonicznych w Celestynowie koło Łodzi]**

Petera, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Łodziensia*, 1996, No.72, Przejawy glacytektoniki w Polsce środkowej (Glaciotectionic symptoms in central Poland), edited by H. Klatkova, p.105-151, In Polish with English summary. 27 refs.

DLC GB588.68.P7P78 1996

Tectonics, Geomorphology, Glacial deposits, Glacial erosion, Glacial geology, Structural analysis, Topographic features, Deformation, Paleoclimatology, Poland—Łódź

53-4415

Remarks on the formation and deformation mechanisms of glacioteconic structures of the Warta Hills. [Uwagi dotyczace wykształcenia i mechanizmów deformacji struktur glacioteconicznych w Pagórkach Warciańskich]

Zabba, M., *Lodzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.72, Przejawy glacioteconiki w Polsce środkowej (Glacioteconic symptoms in central Poland), edited by H. Klatkova, p.153-210, In Polish with English summary. 40 refs.

DLC GB588.68.P7P78 1996

Tectonics, Geomorphology, Glacial deposits, Glacial erosion, Glacial geology, Deformation, Moraines, Structural analysis, Paleoclimatology, Quaternary deposits, Poland

53-4416

General setting for halo theory.

Tape, W., Können, G.P., *Applied optics*, Mar. 20, 1999, 38(9), p.1552-1625, 20 refs.

Ice optics, Ice crystal optics, Ice crystal structure, Atmospheric physics, Optical phenomena, Theories

53-4417

How big should hexagonal ice crystals be to produce halos?

Mishchenko, M.I., Macke, A., *Applied optics*, Mar. 20, 1999, 38(9), p.1626-1629, 37 refs.

Ice crystal structure, Ice crystal size, Ice crystal optics, Cloud physics, Atmospheric physics, Optical phenomena

53-4418

Design and production of ship engine rooms safe from fire. Project final report. [Paloturvallisuustiedon soveltaminen laivan konehuoneen suunnitteluun ja käyttöön (PASOK). Projektin loppuraportti]

Häkkinen, P., Nurmi, T., Pyykönen, O., Varoma, M., *Helsinki University of Technology. Ship Laboratory. Report*, 1998, M-234, 132p., In Finnish. Refs. p.128-132.

Ships, Engines, Fires, Accidents, Safety, Design criteria

53-4419

Statistical summary of accidental ship groundings on shore or on the seafloor in the waters of Finland. [Tilastoyhteenveto Suomen aluevesillä tapahtuneista karilleajoista ja pohjakosketuksista]

Kaila, J., Luukkainen, J., *Helsinki University of Technology. Ship Laboratory. Report*, 1998, M-233, 47p. + appends., In Finnish. 8 refs.

Ships, Safety, Navigation, Accidents, Statistical analysis, Baltic Sea, Finland

53-4420

Strength analysis of laser welded joints in crane-hoisted bulkheads. [Nosturirakenteen pääkannattimissa toteutetun laserhitsatun limiliitoksen lujuusanalyysi]

Remes, H., Kujala, P., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-229, 50p., In Finnish. 3 refs.

Ships, Steel structures, Supports, Joints (junctions), Welding, Lasers, Bearing strength, Strain tests

53-4421

Cruise report. M/S *Sigyn*: Swedish nuclear waste transport ship well worth seeing, from the Lovisa Nuclear Power Plant, Aug. 18, 1997. [Matkakertomus. M/S *Sigyn*: tutustuminen ruotsalaiseen ydinjättilden kuljetusalukseen Lovissassa 18.8.1997]

Jalonen, R., Hellevara, M., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-228, 14p. + appends., In Finnish with English and Swedish versions included as appendices. 7 refs.

Ships, Radioactive wastes, Waste disposal, Cargo, Marine transportation, Logistics

53-4422

Introduction to wave generation by ships. [Johdatus laivan aallonmuodostukseen]

Matusiak, J., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-227, 50p., In Finnish. 24 refs.

Ships, Hydrodynamics, Ocean waves, Water waves, Wave propagation, Cavitation, Mathematical models

53-4423

Strength tests on alternative coatings for corrugated core steel sandwich panels. [Esiteutetun teräskeroslevyrakenteen pinnoltusvaihtoehtojen lujuuskokeet]

Kujala, P., Marttila, P., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-225, 29p. + appends., In Finnish.

Ships, Floors, Steel structures, Protective coatings, Waterproofing, Weatherproofing, Strain tests, Hardness tests

53-4424

Ship technology at the Helsinki University of Technology: strategic planning update. [Laivateknillikka Teknillisessä korkeakoulussa: strategiasuunnitelman päivitys]

Varsta, P., Riska, K., Häkkinen, P., Matusiak, J., Kujala, P., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-222, 18p., In Finnish.

Ships, Research projects, Organizations, Education

53-4425

Ship engines. [Laivan kuljetuskoneisto]

Häkkinen, P., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-220, 323p., In Finnish. Numerous refs. passim.

Ships, Engines, Machinery, Propellers, Design criteria

53-4426

Freezing of soil masses as an aid to engineering construction.

Donohoe, J.F., Maishman, D., Schmall, P.C., Soil improvement for big digs, Boston, MA, Oct. 18-21, 1998. Sessions of Geo-Congress 98. Proceedings. Edited by A. Maher and D.S. Yang. Geotechnical Special Publication No.81, Reston, VA, American Society of Civil Engineers, 1998, p.149-160, 1 ref.

DLC TA710.A1S5227 1998

Soil freezing, Artificial freezing, Soil stabilization, Frozen ground strength, Shaft sinking, Tunneling (excavation), United States—Michigan—Detroit, United States—Louisiana, United States—Massachusetts—Boston

53-4427

Freeze-thaw effects on Boston blue clay.

Swan, C., Greene, C., Soil improvement for big digs, Boston, MA, Oct. 18-21, 1998. Sessions of Geo-Congress 98. Proceedings. Edited by A. Maher and D.S. Yang. Geotechnical Special Publication No.81, Reston, VA, American Society of Civil Engineers, 1998, p.161-176, 6 refs.

DLC TA710.A1S5227 1998

Railroad tunnels, Tunneling (excavation), Soil freezing, Artificial freezing, Soil stabilization, Clay soils, Freeze thaw tests, Frozen ground strength, Frost resistance, United States—Massachusetts—Boston

53-4428

Occupational health care and its development in the Barents region.

Hassi, J., *Barents*, 1998, 1(2), p.46-47,59-60, In English and Russian.

Health, Human factors, Safety, Cold weather survival, Norway, Russia, Finland, Sweden

53-4429

European river activity and climatic change during the Lateglacial and early Holocene. Palaeoclimate Research. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, 226p., Refs. passim. Sponsored by the European Science Foundation (ESF). For individual papers see 53-4430 through 53-4444.

DLC GB1281.E93 1995

River basins, River flow, Channels (waterways), Floodplains, Alluvium, Water erosion, Sediment transport, Terraces, Soil dating, Stratigraphy, Geomorphology, Paleoclimatology

53-4430

Postglacial river activity and climate: state of the art and future prospects.

Vandenbergh, J., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. Palaeoclimate Research. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.1-9, With German summary. 29 refs.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Alluvium, Sediment transport, Geomorphology, Paleoclimatology, Europe

53-4431

Role of rivers in palaeoclimatic reconstruction.

Vandenbergh, J., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. Palaeoclimate Research. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.11-19, With German summary. 27 refs.

DLC GB1281.E93 1995

River basins, River flow, Alluvium, Sediment transport, Geomorphology, Paleoclimatology, Europe

53-4432

Lateglacial-Holocene sedimentation in lowland temperate environments: floodplain metamorphosis and multiple channel systems.

Brown, A.G., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. Palaeoclimate Research. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.21-35, With French summary. 32 refs.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Alluvium, Sediment transport, Channels (waterways), Vegetation factors, Geomorphology, Stratigraphy, Paleoclimatology, United Kingdom

53-4433

Role of carbonate precipitation in the early Holocene palaeohydrology of a chalkland river valley, southern England.

Neumann, H.S., Harris, C., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. Palaeoclimate Research. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.37-50, With German summary. 15 refs.

DLC GB1281.E93 1995

River basins, Paludification, Swamps, Alluvium, Bottom sediment, Stratigraphy, Soil dating, Paleobotany, Paleoclimatology, Paleoclimatology, United Kingdom—England

53-4434

**Lateglacial and early Holocene river activity in lowland Britain.**

Rose, J., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.51-74, With German summary. Refs. p.72-74.

DLC GB1281.E93 1995

River basins, River flow, Alluvium, Water erosion, Channels (waterways), Sediment transport, Geomorphology, Soil dating, Stratigraphy, Paleoclimatology, United Kingdom—England

53-4435

**Place of the Vistula river valley in the late Vistulian-early Holocene evolution of the European valleys.**

Starkel, L., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.75-88, With German summary. Refs. p.85-88.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Alluvium, Sediment transport, Channels (waterways), Geomorphology, Stratigraphy, Paleoclimatology, Europe

53-4436

**Lateglacial and Holocene evolution of some river valleys in Byelorussia.**

Kalicki, T., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.89-100, With German summary. 24 refs.

DLC GB1281.E93 1995

River basins, River flow, Channels (waterways), Water erosion, Alluvium, Stratigraphy, Geomorphology, Paleoclimatology, Belarus

53-4437

**Fluvial activity in Estonia in the Lateglacial and early Holocene.**

Raukas, A., Middel, A., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.101-112, With German summary. 28 refs.

DLC GB1281.E93 1995

Glaciation, Glacial lakes, Isostasy, Sea level, River basins, River flow, Channels (waterways), Alluvium, Water erosion, Geomorphology, Paleoclimatology, Estonia

53-4438

**Development of Lithuanian river valleys in the Lateglacial and Holocene.**

Dvareckas, V., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.113-121, With German summary. 8 refs.

DLC GB1281.E93 1995

Glaciation, Glacial lakes, River basins, River flow, Alluvium, Water erosion, Channels (waterways), Terraces, Floodplains, Geomorphology, Paleoclimatology, Lithuania

53-4439

**Climatic change and fluvial dynamics of the Maas during the late Weichselian and early Holocene.**

Kasse, K., Vandenberghe, J., Bohncke, S., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.123-150, With German summary. Refs. p.147-150.

DLC GB1281.E93 1995

River basins, River flow, Channels (waterways), Alluvium, Water erosion, Terraces, Floodplains, Eolian soils, Sediment transport, Geomorphology, Paleoclimatology, Netherlands

53-4440

**Late Weichselian and Holocene river channel changes of the rivers Rhine and Meuse in the Netherlands (Land van Maas en Waal).**

Berendsen, H., Hoek, W., Schorn, E., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.151-171, With German summary. Refs. p.169-171.

DLC GB1281.E93 1995

River basins, River flow, Channels (waterways), Alluvium, Water erosion, Sediment transport, Floodplains, Soil dating, Geomorphology, Paleoclimatology, Netherlands—Meuse River, Netherlands—Rhine River

53-4441

**Changes in fluvial dynamics in the central Po Plain (Italy) from late Pleistocene to early Holocene.**

Cremaschi, M., Marchetti, M., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.173-190, With French summary. 30 refs.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Channels (waterways), Alluvium, Sediment transport, Water erosion, Soil dating, Geomorphology, Paleoclimatology, Italy—Po River, Italy—Enza River, Italy—Secchia River, Italy—Reno River

53-4442

**Lateglacial and early Holocene geomorphology of the upper Seine river valley.**

Roblin-Jouve, A., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.191-203, With French summary. 14 refs.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Alluvium, Terraces, Soil dating, Geomorphology, Paleoclimatology, France—Seine River

53-4443

**River activity as a function of changing palaeoenvironmental conditions during the Lateglacial-Holocene period in Hungary.**

Gábris, G., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.205-212, With German summary. 25 refs.

DLC GB1281.E93 1995

River basins, River flow, Floodplains, Alluvium, Sediment transport, Terraces, Water erosion, Soil dating, Geomorphology, Paleoclimatology, Hungary

53-4444

**Constraints on the palaeoclimatic control of Lateglacial and early Holocene terrigenous deposits in the Czech Republic.**

Havlicek, P., European river activity and climatic change during the Lateglacial and early Holocene. Edited by B. Frenzel. *Palaeoclimate Research*. Vol.14. ESF Project "European palaeoclimate and man". Special issue No.9, Mainz, Akademie der Wissenschaften und der Literatur, 1995, p.213-222, With German summary. 18 refs.

DLC GB1281.E93 1995

River basins, River flow, Channels (waterways), Floodplains, Alluvium, Eolian soils, Water erosion, Sediment transport, Soil dating, Stratigraphy, Geomorphology, Paleoclimatology, Czech Republic

53-4445

**Estimating the risk of rainfall and snowmelt disastrous floods using physically-based models of river runoff generation.**

Kuchment, L.S., *International Association of Hydrological Sciences. IAHS publication*, 1997, No.239, Conference on Destructive Water: Water-Caused Natural Disasters, their Abatement and Control, Anaheim, CA, June 1996. Proceedings, p.95-100, 4 refs. Snow hydrology, Snowmelt, Precipitation (meteorology), River basins, Stream flow, Runoff forecasting, Flood forecasting, Statistical analysis, Russia

53-4446

**Succession on river alluvium in northern Alaska.**

Bliss, L.C., Cantor, J.E., *American midland naturalist*, 1957, 58(2), p.452-469, 38 refs. Tundra vegetation, Plant ecology, Vegetation patterns, Revegetation, Rivers, Floodplains, Alluvium, United States—Alaska—North Slope

53-4447

**Mass balance, meteorological, ice motion, surface altitude, and runoff data at Gulkana Glacier, Alaska, 1994 balance year.**

March, R.S., *U.S. Geological Survey. Water-resources investigations report*, 1998, No.97-4251, 31p., 36 refs. Glacier surveys, Glacier mass balance, Glacier oscillation, Glacier thickness, Glacier flow, Glacial hydrology, Glacial meteorology, Meltwater, Runoff, Stream flow, United States—Alaska—Gulkana Glacier

53-4448

**Verification of water-quality model to simulate effects of discharging treated wastewater during ice-cover conditions to the Red River of the North at Fargo, North Dakota, and Moorhead, Minnesota.**

Wesolowski, E.A., *U.S. Geological Survey. Water-resources investigations report*, 1996, No.95-4292, 20p., 3 refs. Water treatment, Waste disposal, Sewage disposal, Stream flow, Water pollution, Water chemistry, River ice, Ice water interface, Ice cover effect, River flow, Computer programs, United States—North Dakota—Fargo, United States—Minnesota—Moorhead

53-4449

**Winter 98-99 roundup.**

Kellam, J., *Avalanche review*, Spring/Summer 1999, 17(6), p.1,4-7. Avalanches, Accidents, Avalanche forecasting, United States

53-4450

**Collapsible avalanche probe and probe-pole test.**

Toepfer, S., Morris, H., *Avalanche review*, Spring/Summer 1999, 17(6), p.8-9. Avalanches, Rescue equipment, Probes, Snow survey tools, Portable equipment

53-4451

**Weather and avalanches in Austria: a brief synopsis of the Austrian Alps.**

Höller, P., *Avalanche review*, Spring/Summer 1999, 17(6), p.10. Avalanches, Accidents, Snowfall, Meteorological data, Meteorological factors, Austria

## 53-4452

**European avalanches of 1998-99.**

Bachman, D., *Avalanche review*, Spring/Summer 1999, 17(6), p.11.

Avalanches, Accidents, Austria, Switzerland

## 53-4453

**Earth's cryosphere and global environmental change.**

Williams, R.S., Jr., Columbia Earth Institute. Distinguished Lectures on the Global Environment Series, Palisades, NY, Columbia University, Lamont-Doherty Earth Observatory, 1999, 20p., 50 refs. Prepared as a companion document for a lecture on Apr. 7, 1999.

Glaciation, Glacier oscillation, Paleoclimatology, Ice age theory, Global change

## 53-4454

**Miscellaneous information about glaciers.**

Williams, R.S., Jr., Ferrigno, J.G., Woods Hole, MA, U.S. Geological Survey, 1999, 7p., Unpublished list of selected publications including some web sites and some to be published.

Glaciology, Glacier surveys, Research projects, Bibliographies, Data processing

## 53-4455

**Clay barriers, chemical and mineralogical analyses.**

Inyang, H.I., Fang, H.Y., Choquette, M.R., Iskandar, I.K., MP 5361, *Encyclopedia of environmental analysis and remediation*, Vol.2, New York, Wiley, 1998, p.1158-1165, 12 refs.

DLC GE10.E49 1998

Waste disposal, Earth fills, Land reclamation, Linings, Clay soils, Soil analysis, Chemical analysis, Soil composition, Clay minerals, Mineralogy

## 53-4456

**Lab forms 6,000-mile education partnership.**

Darling, M., MP 5362, *Engineer update*, Apr. 1997, 21(4), p.4.

Research projects, Education, Organizations, Regional planning, United States—Alaska—Barrow

## 53-4457

**Roof moisture sensing system and method for determining presence of moisture in a roof structure.**

Yankielun, N.E., Flanders, S.N., MP 5363, *U.S. Patent Office. Patent*, Oct. 6, 1998, 6 col., USP-5,818,340, 14 refs.

Roofs, Leakage, Moisture meters, Moisture detection  
A roof moisture sensing system includes (1) a radio frequency pulse transmitter, (2) a moisture sensor disposed on a roof and (3) a radio receiver adapted to monitor resonance of the moisture sensor activated by a pulse transmitted by the pulse transmitter. The receiver is adapted to analyze the resonance of the sensor to determine the presence of moisture in the sensor. The transmitter and the receiver can be remote from the sensor and the roof.

## 53-4458

**Geosynthetic barriers to prevent poisoning of waterfowl.**

Henry, K.S., Stark, J.A., MP 5364, International Conference on Soil Mechanics and Foundation Engineering, 14th, Hamburg, Germany, Sep. 6-12, 1997. Proceedings, Rotterdam, A.A. Balkema, 1997, p.1819-1822, 9 refs.

Ponds, Water pollution, Bottom sediment, Explosives, Soil pollution, Land reclamation, Soil stabilization, Animals, Environmental protection, Geotextiles

The feasibility of using geosynthetics to cover contaminated pond sediments and prevent waterfowl access to them was studied. Geosynthetic barriers were placed in ponds, the water above them was vigorously stirred, and the barriers were loaded by dropping a mass onto them to determine their ability to retain sediment below them and withstand damage. The barriers reduced the amount of sediment resuspended during stir and loading tests by at least 30%, and sustained no damage. Thus, they can probably prevent waterfowl from accessing and eating toxic particles contained in the sediment below them.

## 53-4459

**Performance of water spread limiting and loose fill insulation: Federal Agency approved heat distribution systems.**

Phetteplace, G., Monaghan, S.K., Pedrick, G., MP 5365, International District Heating Association Annual Conference, 89th, San Antonio, TX, June 13-16, 1998. Proceedings, Washington, D.C., International District Heating Association, [1998], p.181-195, 9 refs.

Military facilities, Utilities, Heating, Heat transmission, Heat pipes, Heat loss, Underground pipelines, Pipeline insulation, Earth fills, Thermal insulation, Cost analysis, United States

The U.S. Army Cold Regions Research and Engineering Laboratory has conducted an in-depth field study of water spread limiting and loose fill insulation types of underground heat distribution systems at 20 sites throughout the U.S. This research originated with interest in the performance of Federal Agency prequalified underground heat distribution systems. The water spread limiting (WSL) system investigated has preinsulated pipe sections that are sealed on each end and uses a composite insulation with no air space between the insulation and casing. Adjacent pipe sections are joined by a coupling assembly that allows the pipe sections to expand and contract freely. The loose fill insulation (LFI) system investigated places an uninsulated pipe in formed trenches and fills the trench with a calcium carbonate powder insulation, covering it with a vapor barrier and backfilling. At each site, potential problem areas were identified using infrared imaging. The study excavated and instrumented 11 WSL installations and four LFI systems ranging from under one to 21 years of age. Estimates of heat losses based on field measurements and other observations are presented.

## 53-4460

**Condition assessment for buried heat distribution systems using infrared thermography.**

Phetteplace, G., Pedrick, G., Monaghan, S.K., MP 5366, International District Heating Association Annual Conference, 89th, San Antonio, TX, June 13-16, 1998. Proceedings, Washington, D.C., International District Heating Association, [1998], p.219-229, 12 refs.

Utilities, Heating, Heat transmission, Heat pipes, Heat loss, Underground pipelines, Soil temperature, Temperature measurement, Infrared photography, United States

It has been known for some time that infrared thermography could find problem areas on buried heat distribution systems, just as it has for roofs and electrical distribution systems. While such information is useful for locating areas of major failures, for planning purposes some quantification of the results from an infrared survey of major portions of a heat distribution system would be advantageous. Some recent progress has been made toward this end by two International Energy Agency District Heating projects in which the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) has participated. The objective of these projects was to develop a method that would allow quantification of heat losses from the temperature profile of the ground's surface above the buried heat distribution pipeline. Basically, the method uses the integral of the temperature distribution at the ground's surface along with climatological and system data to arrive at an empirical estimate of the heat loss. Using this method, CRREL has conducted infrared surveys of two facilities. Results have been good, and the facilities have been provided with both heat loss estimates and prioritized replacement lists. This paper describes the "TX method," as it is called, and its use. Sample results from the surveys done to date are also presented.

## 53-4461

**Heat loss determination for district heating systems using surface temperature measurements.**

Phetteplace, G., MP 5367, *Technical University of Denmark, Lyngby. Department of Energy Engineering. [Report]*, Oct. 1998, ET-ES 98-13, 22p., 15 refs.

Utilities, Heating, Heat transmission, Heat pipes, Heat transfer, Heat loss, Underground pipelines, Soil temperature, Surface temperature, Temperature measurement, Infrared photography, Mathematical models, United States

It has been known for some time that surface temperature measurements via infrared thermography could find problem areas in the buried piping of district heating systems. While such information is useful for locating areas of major failures, for planning purposes some quantification of the results is needed. Some recent progress has been made towards this end by two International Energy Agency (IEA) District Heating projects. The objective of these projects was to develop a method that would allow quantification of heat losses from the temperature profile of the ground's surface above the buried heat distribution pipeline. Basically, the method uses the integral of the temperature distribution at the ground's surface along with climatological and system data to get an empirical estimate of the heat loss. The IEA projects developed and proposed several models that correlated heat loss from buried district heating pipes to the temperature distribution at the ground surface above those pipes. In each case the so called "TX" models were "empirically" determined by

fitting parameters to results obtained by detailed numerical simulations. These models were tested against field data obtained from test sites in Sweden, Denmark, Finland and the U.S. The investigators felt that within a limited range of parameter values and under appropriate conditions for the infrared measurements results could be expected to be within  $\pm 20\%$ . Using the proposed methods the US Army Cold Regions Research and Engineering Laboratory has conducted infrared surveys of two district heating systems. While in general the results of these studies have been useful, it was often necessary to extrapolate the input parameter values of the method beyond the range originally used in the simulations as well as the range defined by the experimental measurements. Thus, the confidence of the method could be improved by extending its known range of applicability. Some extensions to the original TX models were proposed. These extensions provided a form for the model that would appear to be more intuitive when basic heat transfer theory is considered. This report describes further potential improvements to the methods proposed by the earlier investigators based primarily on the heat transfer theory for buried line sources.

## 53-4462

**Testing of fiberglass composite bridge deck panels.**

Harik, I., et al, MP 5368, International Conference on Boundary Element Technology, 13th, 1999 (BETECH 99), incorporating Computational Methods and Testing for Engineering Integrity, Southampton, England, International Society for Boundary Elements, 1999, p.663-672, 3 refs.

Bridges, Composite materials, Plastics, Dynamic loads, Impact tests, Bearing tests, Strain tests, Design criteria

Experimental investigations are carried out on fiberglass composite bridge deck panels under a three-point bending test. A rectangular patch load, which represents the AASHTO standard HS25 truck wheel load, is applied at the center of each panel. The breadth of all panels is 36 in. The depths of the panels are 8.5 in, 9 in and 9.5 in. The span lengths of the panels are 86 in, 120 in and 144 in. The in-plane deformations and out-of-plane deflections are measured using strain gages and linear variable deflection transducers. The measured deflections of the panels under service load are compared with allowable deflection limits. The response of the panels under cyclic loading, the load at failure, and the deformability and mode of failure are reported. It is found that the fiberglass composite deck panels satisfy the allowable deflection criteria, and the factor of safety against collapse is greater than 6.5 for all panels.

## 53-4463

**Removing spring thaw load restrictions from low-volume roads: development of a reliable, cost-effective method.**

Kestler, M.A., Hanek, G., Truebe, M., Bolander, P., MP 5369, *Transportation research record*, 1999, No.1652, International Conference on Low-Volume Roads, 7th, Baton Rouge, LA, May 23-26, 1999, p.188-197, 15 refs.

Pavements, Thaw depth, Thaw weakening, Trafficability, Moisture meters, Moisture detection, Highway planning, Road maintenance, United States

Low-volume roads in areas of seasonal freezing are highly susceptible to damage from trafficking during spring thaw. To minimize pavement damage, many agencies and states impose load restrictions during periods in which damage is most likely to occur. However, the magnitude and duration of reduced or prohibited hauling vary widely among agencies, and an optimal balance between maximizing local economy and minimizing road damage is rarely achieved. The U.S. Department of Agriculture Forest Service and the U.S. Army Cold Regions Research and Engineering Laboratory are evaluating a quantitative technique for removing load restrictions by developing correlations between pavement stiffness and soil moisture. Laboratory tests of the moisture sensors showed them to be accurate and repeatable under adverse freeze-thaw cycling. Preliminary analysis of field data showed that permanently installed time domain reflectometry and radio frequency soil moisture sensors strategically located throughout the forest road network will provide an affordable method for quantitatively determining when to remove load restrictions. Load restriction practices are reviewed, economic ramifications on the forest industry are briefly discussed, and laboratory and field test programs conducted to monitor soil moisture and pavement stiffness are outlined. In addition, instrumentation used for the study is described, observations from one of four national forest pavement test sites are presented, and the ongoing research to develop a method to remove load restrictions is discussed.

## 53-4464

**Ice events in the St. Louis District.**

White, K.D., Mulherin, N.D., MP 5370, *U.S. Army Cold Regions Research and Engineering Laboratory. Ice engineering information exchange bulletin*, Feb. 1999, No.20, 4p., 10 refs.

River ice, Ice jams, Floods, Cost analysis, Data processing, United States—Missouri, United States—Illinois

53-4465

**Ice jams, winter 1996-97.**  
Peterson, E.K., Herrin, L., White, K.D., MP 5371, *U.S. Army Cold Regions Research and Engineering Laboratory. Ice engineering information exchange bulletin*, June 1998, No.18, 4p., 4 refs.  
River ice, Ice jams, Floods, Data processing, United States

53-4466

**Registration of RWR-Tetra-1 tetraploid Russian wildrye germplasm.**  
Jensen, K.B., Asay, K.H., Johnson, D.A., Horton, W.H., Palazzo, A.J., Chatterton, N.J., MP 5372, *Crop science*, 1998, Vol.38, p.1405, 5 refs.  
Grasses, Plants (botany), Introduced plants, Plant physiology, Plant tissues, Plant ecology, Agriculture

53-4467

**Proceedings. River ice management with a changing climate: dealing with extreme events.**  
Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999, Doering, J.C., ed, Winnipeg, University of Manitoba, 1999, 409p., Refs. passim.  
Organized by the Committee on River Ice Processes and the Environment (CRIPLE), Canadian Geophysical Union, Hydrology Section. For individual papers see 53-4468 through 53-4498.

River ice, Ice breakup, Ice jams, Ice forecasting, Ice control, Ice cover effect, Ice water interface, River flow, Flood forecasting, Flood control

53-4468

**Simple test for the suitability of equilibrium thickness.**

Zufelt, J.E., MP 5373, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.1-14, 15 refs.

River ice, Ice jams, Ice cover thickness, Ice cover strength, Ice cover effect, Ice friction, Ice deformation, Ice breakup, Ice forecasting, Ice water interface, River flow, Flood forecasting, Mathematical models, Computerized simulation  
Equilibrium ice thickness theory provides for a simple calculation of ice jam thickness given some basic information on river characteristics. There are several assumptions attendant with the use of equilibrium theory that may be violated by some numerical models. Highly unsteady flow situations demand the use of unsteady flow models in the determination of jam thickness. Gradually varying discharge situations, however, may find the use of equilibrium theory perfectly suitable, with minimal error in calculated jam thickness. A dimensionless parameter is proposed and demonstrated for use in determining whether simple equilibrium thickness calculations or a more complex unsteady model is required for the calculation of ice jam thickness.

53-4469

**Prediction of ice jam water levels in a multi-channel river: Fort Albany, Ontario.**  
Grover, P., Vrkiljan, C., Beltaos, S., Andres, D., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.15-29, 5 refs.  
River ice, Ice jams, Ice breakup, Ice forecasting, Ice cover effect, Ice water interface, River flow, Flood forecasting, Statistical analysis, Computerized simulation, Canada—Ontario—Fort Albany

53-4470

**Forecasting systematic ice jam occurrence along the Yukon River, Alaska.**  
White, K.D., MP 5374, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.30-43, 11 refs.

River ice, Ice breakup, Ice jams, Ice reporting, Ice forecasting, Flood forecasting, Data processing, Statistical analysis, United States—Alaska—Yukon River  
Many long northern rivers experience a single, snowmelt-driven, ice-cover breakup that progresses downstream and results in the occurrence of ice jams. For example, the ice jams that form annually on the Yukon River generally occur during May and June and progress from east (upstream) to west (downstream). In some years, the jam-

ming progresses in an orderly, systematic fashion, and in others the jam occurrence is marked by long delays. Since most development in the Yukon River basin is clustered along the river, the ice jams may cause flooding and damage to structures as well as disrupt transportation. Long-term empirical forecasts of the likelihood of spring ice-related flooding are made by the National Weather Service Alaska River Forecast Center. Combining this long-term forecast of jam likelihood with near-term forecasts of jam occurrence could improve ice jam mitigation and reduce damages. This paper presents a forecast matrix based on observed jam dates that can be used in preparing near-term forecasts of systematic ice jam occurrence along the Yukon River.

53-4471

**Boom for reducing ice management problems in the Rideau River.**

Abdelnour, R., Gong, Y.X., Reid, B., Assaff, G., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.44-58, 9 refs.  
River ice, Frazil ice, Bottom ice, Ice formation, Freezeup, Ice cover thickness, Ice control, Ice booms, Flood control, Canada—Ontario—Rideau River, Canada—Ontario—Ottawa

53-4472

**Discrete element modeling of river ice at navigation structures.**

Hopkins, M.A., Daly, S.F., MP 5375, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.59-69, 8 refs.

Locks (waterways), Sluices (hydraulic engineering), Hydraulic structures, River ice, Ice loads, Ice friction, Ice navigation, Ice passing, Ice control, Bubbling, Computerized simulation  
Recent advances in discrete element modeling now allow the direct simulation of brash ice in a lock entrance approach. Ice in the lock approach interferes with the miter gate operation and delays barge transiting because separate lockages are needed to pass the accumulated ice. Discrete element simulation resolves the contact and body forces acting on thousands of individual floes at each time step to model the movement of brash ice floes. The movement of ice in the lock approach is largely affected by the opening of the upstream lock miter gates, the operation of high-flow air bubble, and the transiting of barges. All of these phenomena are included in the simulation. This allows the effectiveness of the high-flow bubble in managing ice to be assessed, and the interaction of the ice floes and the barges to be studied. Discrete element simulation promises to be an important tool for investigating ice in lock approaches and designing ice-management measures.

53-4473

**Static ice loads on wooden and steel stoplogs at Seven Sisters Generating Station.**

Gong, Y.X., Penner, R., Comfort, G., Armstrong, T., Schellenberg, G., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.70-84, 6 refs.  
Dams, Hydraulic structures, Wooden structures, Steel structures, River ice, Ice loads, Ice pressure, Ice control, Strain tests, Canada—Manitoba—Winnipeg River

53-4474

**Simulating winter environments for aquatic life in the CRRLE refrigerated flume.**

White, K.D., Daly, S.F., Gagnon, J.J., MP 5376, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.85-96, 13 refs.  
River ice, Ice conditions, Frazil ice, Bottom ice, Ice cover effect, Physiological effects, Animals, Ecology, Cold weather survival, Environmental tests, Environment simulation

Winter creates potentially stressful conditions for fish in northern rivers where frazil ice is produced. It has been hypothesized that the most adverse conditions are found in rivers that are partially ice covered. These rivers experience larger fluctuations in water temperature and ice conditions, including more frequent overcooling and frazil ice events. While little is known about the response of freshwater fish to frazil ice and the supercooled water associated with it, it is known that these fish do not contain the antifreeze compounds found in the blood of marine fish. Fish kills have been reported after super-

cooling events, yet no clear causal relationships have been found. Fish may be adversely affected by frazil ice accumulating in their gills, anchor ice forming on the bed, and frazil being deposited under the ice cover. Anchor ice can cover and smooth the substrate that provides both food and hiding places for the fish. Frazil ice deposition beneath an ice cover may change the hydraulics of the river, decreasing the availability of slow-moving areas in a riffle-pool stream. Traditional field methods of examining frazil effects on aquatic fish are time-consuming and expensive, and often provide only a small indigenous sample population from which to infer behavior. The CRRLE refrigerated flume provides a facility capable of testing a range of riverine conditions, which will allow researchers to design careful experiments to observe ice effects on fish. This paper reports on the conditions attained in the flume during a preliminary test series with rainbow trout, including bed slope, water depth and velocity, water temperature, and the type, size, and distribution of typical substrate materials.

53-4475

**Blood chemistry and swimming activity of rainbow trout exposed to supercooling and frazil ice.**

Brown, R.S., Brodeur, J.C., Power, G., Daly, S.F., White, K.D., McKinley, R.S., MP 5377, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.97-110, 25 refs.

River ice, Ice conditions, Frazil ice, Bottom ice, Ice cover effect, Supercooling, Physiological effects, Animals, Ecology, Cold tolerance, Cold weather survival

Adult and juvenile rainbow trout (*Oncorhynchus mykiss*) were exposed to supercooled temperatures, frazil ice and anchor ice in a refrigerated flume at the Cold Regions Research and Engineering Laboratory (Hanover, NH). The blood chemistry of the fish was measured before and after they were exposed to a frazil ice event. Plasma chloride, sodium and potassium levels were significantly reduced in juvenile rainbow trout after 6.5 h of exposure to supercooling, frazil ice and anchor ice. Plasma lactate did not vary but plasma glucose was increased although not in a statistically significant manner. Blood parameters of adult fish varied in a similar way as in juveniles but none of the changes were statistically significant. The swimming activity of half of the adult fish (measured by electromyogram telemetry) was significantly lower while exposed to frazil and anchor ice, and none were more active. The escape response of adult rainbow trout was decreased when they were exposed to supercooled water and frazil and anchor ice. This reduction in activity and escape response may increase the likelihood of avian or mammalian predation during subsurface ice events. These sublethal effects observed during exposure to supercooling and frazil ice suggest that further research is needed to determine how such events might impair fish survival.

53-4476

**Winter design features of Goose Creek Enhancement Works, Churchill, Manitoba.**

Shumilak, B.E., Remnant, R.A., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.111-125, 16 refs.

River flow, Flow control, Channel stabilization, Hydraulic structures, Environmental protection, Land reclamation, Ecosystems, Animals, Ecology, River ice, Ice conditions, Ice cover effect, Ice control, Design criteria, Canada—Manitoba—Churchill

53-4477

**Ice problems of the Yellow River, China.**

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River ice, Ice conditions, Freezeup, Ice breakup, Ice jams, Ice forecasting, Flood forecasting, China—Yellow River



53-4478

**Case study: lower Churchill River water level enhancement weir project.**

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River flow, Flow control, Channel stabilization, Hydraulic structures, Flood control, River ice, Ice breakup, Ice jams, Ice control, Canada—Manitoba—Churchill

53-4479

**Manasan ice control structures.**

Wang, P.D., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.150-159, 3 refs.

River flow, Flow control, Hydraulic structures, Rock fills, River ice, Ice jams, Ice booms, Ice control, Flood control, Canada—Manitoba—Thompson

53-4480

**Anchor ice formation below Limestone Generating Station: a case study.**

Girling, W.C., Groeneveld, J., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.160-173, 3 refs.

River ice, Bottom ice, Fast ice, Ice formation, Ice growth, Ice water interface, River flow, Flow control, Channel stabilization, Dredging, Ice control, Flood control, Canada—Manitoba—Nelson River

53-4481

**Analysis of ice jam surge and ice velocity data.**

Jasek, M., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.174-184, 6 refs.

River ice, Ice jams, Ice breakup, Ice friction, Ice cover effect, Ice water interface, River flow, Ice forecasting, Flood forecasting, Canada—Yukon Territory—Porcupine River, Canada—Yukon Territory—Yukon River

53-4482

**Assessment of the applicability of steady flow ice jam profile models.**

Healy, D., Hicks, F.E., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.185-195, 8 refs.

River ice, Ice jams, Ice breakup, Ice friction, Ice cover thickness, Ice cover effect, Ice forecasting, Ice water interface, River flow, Flood forecasting, Computerized simulation

53-4483

**Numerical simulation of ice clearing and jam initiation in navigation channels.**

Sayed, M., Morse, B., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.196-208, 12 refs.

River ice, Ice jams, Ice breakup, Ice friction, Ice passing, Ice water interface, River flow, Ice forecasting, Mathematical models

53-4484

**Effects of freezing on the stability of a juxtaposed ice cover.**

Andres, D.D., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.209-222, 9 refs.

River ice, Frazil ice, Ice formation, Freezeup, Ice growth, Ice friction, Ice cover thickness, Ice cover strength, Ice forecasting, Mathematical models

53-4485

**LSPIV and numerical-model estimation of Yukon River discharge during an ice jam near Dawson.**

Jasek, M., Muste, M., Ettema, R., Kruger, A., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.223-235, 7 refs.

River ice, Ice jams, Ice breakup, Ice cover effect, Ice forecasting, Ice water interface, River flow, Flow measurement, Flood forecasting, Image processing, Computerized simulation, Canada—Yukon Territory—Dawson

53-4486

**Review of river-ice impacts on alluvial-channel stability.**

Ettema, R., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.236-250, 25 refs.

River ice, Ice cover effect, Ice water interface, River flow, Alluvium, Sediment transport, Channel stabilization, Channels (waterways), Banks (waterways), Ice erosion, Water erosion

53-4487

**Climatic effects on the changing ice-breakup regime of the Saint John River.**

Beltaos, S., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.251-264, 20 refs.

River ice, Ice conditions, Ice breakup, Ice jams, Ice cover effect, Floods, Climatic changes, Climatic factors, Ice forecasting, Flood forecasting, Statistical analysis, Canada—New Brunswick—Saint John River

53-4488

**Construction and maintenance of winter roads in Manitoba.**

Kuryk, D., Domaratzki, M., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.265-275.

Highway planning, Road maintenance, Regional planning, Ice roads, Canada—Manitoba

53-4489

**Concentration of minerals by ice in long shallow lakes.**

Sydor, M., Boutot, W., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.276-289, With French summary. 6 refs.

River ice, Lake ice, Reservoirs, Water supply, Water reserves, Ice cover effect, Ice water interface, Meltwater, Lake water, Water chemistry, Suspended sediments, Minerals, Hydrogeochemistry

53-4490

**Overview of ice load measurements on bridge piers.**

Johnston, M.E., Timco, G.W., Frederking, R.M.W., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.290-302, 20 refs.

Bridges, Piers, River ice, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice cover thickness, Ice breaking, Strain tests

53-4491

**Cazenovia Creek ice control structure: a comparison of two concepts.**

Lever, J.H., Gooch, G., MP 5378, Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.303-317, 11 refs.

River ice, Ice breakup, Ice jams, Hydraulic structures, Piers, Spillways, Channel stabilization, Ice control, Flood control, Cost analysis, United States—New York

In 1984, CRREL conducted model tests of a structure to control breakup ice jams on Cazenovia Creek in West Seneca, NY. It consisted of a 1.8-m-high weir with 9 ice-retaining piers, an excavated pool to store ice pieces, and a prepared floodway. Although the model structure performed well, the prototype was not built because the community could not afford its portion of the project cost of \$2.1M (1986 dollars). The authors recently completed model tests of a new ice-control structure for Cazenovia Creek. It consists of nine 3-m-tall x 1.5-m-diameter cylindrical piers spaced across the main channel at the same site. It does not require a weir or excavated pool, and it uses the adjoining tree floodplain as a natural bypass channel. Consequently, it should cost substantially less than the original structure. Test results show that the new structure retains ice at least as well as the original one.

53-4492

**Is  $\phi$  a constant for broken ice rubble.**

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River ice, Ice pileup, Ice cover strength, Ice loads, Ice friction, Ice pressure, Ice deformation, Ice breaking, Strain tests, Mathematical models

53-4493

**Ice boom design at Manitoba Hydro.**

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River ice, Ice control, Ice booms, River flow, Flow control, Hydraulic structures, Canada—Manitoba

53-4494

**Design considerations for the use of ice as a construction platform.**

Hicks, F.E., Fayek, A., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.346-360, 17 refs.

Lake ice, River ice, Ice crossings, Ice roads, Ice (construction material), Ice cover strength, Ice elasticity, Ice loads, Trafficability, Bearing strength, Design criteria, Mathematical models

53-4495

**Assessing the susceptibility of shorelines to inundation by ice: a practical approach.**

Gawne, K.D., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.361-376, 20 refs.

Reservoirs, Lake ice, Ice push, Ice pileup, Ice over-ride, Ice pressure, Ice loads, Ice erosion, Shore erosion, Ice forecasting, Mathematical models

53-4496

Laboratory studies of anchor ice growth using a digital image processing system.

Doering, J.C., Morris, M.P., Girling, W.C., Dow, K., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.377-387, 4 refs.

River ice, Freezeup, Frazil ice, Bottom ice, Ice formation, Ice growth, Ice forecasting, Ice control, Dredging, Image processing, Environmental tests

53-4497

River ice processes in tidal rivers: research needs.

Morse, B., Burrell, B., St.Hilaire, A., Bergeron, N., Messier, D., Quach Thanh, T., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.388-399, 27 refs.

Estuaries, River ice, Ice conditions, Ice cover effect, Ice forecasting, Flood forecasting, Environmental impact, Climatic changes, Research projects

53-4498

Turbulent structure of ice-covered flow and ice impact upon habitat in rivers.

Dolgoplova, E.N., Workshop on River Ice, 10th, Winnipeg, Manitoba, June 8-11, 1999. Proceedings. River ice management with a changing climate: dealing with extreme events. Edited by J.C. Doering, Winnipeg, University of Manitoba, 1999, p.400-409, 24 refs.

River ice, Ice cover effect, Ice water interface, River flow, Ecosystems, Environmental impact

53-4499

Personal-computer program for analysis and evaluation of the condition of earth dams.

Gelfand, R.E., *Hydrotechnical construction*, Aug. 1998(Pub. Feb.99), 32(8), p.439-445, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 1 refs.

Computer programs, Earth dams, Monitors, Safety, Seepage, Deformation, Frost action, Thermal regime, Warning systems

53-4500

Conditions for reliable dewatering systems based on voidless drainage in slightly permeable soils.

Shtykov, V.I., *Hydrotechnical construction*, Aug. 1998(Pub. Feb.99), 32(8), p.459-462, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 4 refs.

Permeability, Seepage, Design criteria, Seasonal freeze thaw, Drainage, Frozen ground, Gravel, Run-off

53-4501

Dynamic model of the oxygen regime of a reservoir.

Sokolov, A.G., Dmitrieva, I.L., *Hydrotechnical construction*, July 1996(Pub. Jan.97), 30(7), p.392-399, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 6 refs.

Reservoirs, Mathematical models, Oxygen, Ice cover effect, Thermal regime, Aeration, Russia—Zagorsk, Russia—Krasnozavodsk

53-4502

Operation and safety of hydroelectric stations seepage regime of structures at the Zagorsk pumped-storage station during temporary operation.

Kanygin, L.E., Chernenko, V.N., Magruk, V.I., IAnovskii, A.P., *Hydrotechnical construction*, July 1996(Pub. Jan.97), 30(7), p.400-405, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 5 refs.

Electric power, Safety, Seepage, Hydraulic structures, Walls, Foundations, Water level, Monitors, Measuring instruments, Russia—Zagorsk

53-4503

Selection of the revetment on the upstream slope of the upper reservoir at the Zagorsk pumped-storage station and its condition after seven years' service.

Busygina, T.V., IAnovskii, A.P., *Hydrotechnical construction*, July 1996(Pub. Jan.97), 30(7), p.406-408, Translated from *Gidrotekhnicheskoe stroitel'stvo*. Electric power, Hydraulic structures, Reservoirs, Design criteria, Cold weather operation, Joints (junctions), Reinforced concretes, Wood, Winter concreting, Russia—Zagorsk

53-4504

Water transport and power network of North European Russia.

Pravdivets, I.U.P., Beliakov, A.A., Levachev, S.N., *Hydrotechnical construction*, July 1996(Pub. Jan.97), 30(7), p.409-416, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 13 refs.

Water transport, Electric power, Regional planning, Hydraulic structures, Rivers, River flow, Runoff, Russia—White Sea, Baltic Sea, Russia—Neva River, Russia—Ladoga, Lake

53-4505

Problems of completing the construction of hydroelectric stations.

Shahtanov, V.I.A., Ryzhov, V.A., IUrkevich, B.N., *Hydrotechnical construction*, July 1998(Pub. Jan.99), 32(7), p.363-367, Translated from *Gidrotekhnicheskoe stroitel'stvo*.

Electric power, Hydraulic structures, Regional planning, Economic analysis, Russia—Siberia, Russia—Far East, Caucasus

53-4506

Strength and deformation characteristics of concrete of the Vilyui III hydroelectric station.

Starshinov, S.N., *Hydrotechnical construction*, July 1998(Pub. Jan.99), 32(7), p.374-379, Translated from *Gidrotekhnicheskoe stroitel'stvo*. 9 refs.

Electric power, Hydraulic structures, Winter concreting, Concretes, Concrete strength, Concrete freezing, Elastic properties, Frost resistance, Deformation, Compressive properties, Russia—Vilyuy River

53-4507

Characteristics of the thermal stress-state of concrete masses on rock foundations with a complex relief.

Sokolov, I.B., Bondarenko, A.G., *Hydrotechnical construction*, July 1998(Pub. Jan.99), 32(7), p.380-384, Translated from *Gidrotekhnicheskoe stroitel'stvo*.

Dams, Foundations, Cold stress, Winter concreting, Thermal stresses, Concrete strength, Cracking (fracturing), Electric power, Hydraulic structures, Reservoirs, Russia—Yenisey River, Russia—Kirovsk, Russia—Zeya River, Russia—Bratsk

53-4508

Seasonal variation in nutrients, pelagic primary production and grazing in a high-Arctic coastal marine ecosystem, Young Sound, Northeast Greenland.

Rysgaard, S., Nielsen, T.G., Hansen, B.W., *Marine ecology progress series*, Apr. 15, 1999, Vol.179, p.13-25, Refs. p.22-25.

Biomass, Plankton, Marine biology, Microbiology, Nutrient cycle, Sea ice, Ice cover effect, Global warming, Hydrography, Algae, Seasonal variations, Greenland—Young Sound

53-4509

Sources of urea in arctic seas: zooplankton metabolism.

Conover, R.J., Gustavson, K.R., *Marine ecology progress series*, Apr. 15, 1999, Vol.179, p.41-54, 64 refs.

Plankton, Marine biology, Microbiology, Sea water, Water chemistry, Sea ice, Fast ice, Algae, Seasonal variations, Nutrient cycle, Ice cover effect, Ice melting, Freezeup, Canada—Northwest Territories—Barrow Strait

53-4510

Sources of urea in arctic seas: seasonal fast ice?

Conover, R.J., Mumm, N., Bruecker, P., MacKenzie, S., *Marine ecology progress series*, Apr. 15, 1999, Vol.179, p.55-69, 51 refs.

Nutrient cycle, Sea water, Water chemistry, Sea ice, Ice cover effect, Algae, Fast ice, Plankton, Chlorophylls, Ice breakup, Freezeup, Salinity, Ice composition, Canada—Northwest Territories—Resolute Passage, Antarctica

53-4511

Foundation design aspects of the Confederation Bridge.

Becker, D.E., Burwash, W.J., Montgomery, R.A., Liu, Y., *Canadian geotechnical journal*, Oct. 1998, 35(5), p.750-768, With French summary. 36 refs.

Bridges, Foundations, Design, Design criteria, Footings, Loads (forces), Compressive properties, Settlement (structural), Precast concretes, Cold weather construction, Ice cover effect, Canada—Northumberland Strait

53-4512

Instrumentation and monitoring of an engineered soil cover system for mine waste rock.

O'Kane, M., Wilson, G.W., Barbour, S.L., *Canadian geotechnical journal*, Oct. 1998, 35(5), p.828-846, With French summary. 35 refs.

Soil water, Oxygen, Mining, Monitors, Snowmelt, Measuring instruments, Thermal conductivity, Water content, Saturation, Hydraulics, Soil mechanics, Canada

53-4513

On thermokarst genesis of the Łęczna-Włodawa lakes. [O termokrasowej genezie jezior Łęczno-włodawskich]

Wojtanowicz, J., *Lublin. Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.1-18, In Polish with English summary. 47 refs.

DLC QE1.L923 Vol.49 1994

Glacial lakes, Pleistocene, Thermokarst lakes, Thermokarst development, Geomorphology, Peat, Ground ice, Permafrost, Poland—Łęczna Lake, Poland—Włodawa Lake

53-4514

Stratigraphy of glacial formation of the middle and upper Pleistocene in south-east Poland.

[Stratygrafia utworów glacialnych środkowego i górnego plejstocenu Polski południowo-wschodniej]

Dolecki, L., Harasimiuk, M., Wojtanowicz, J., *Lublin. Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.19-31, In Polish with English summary. 41 refs.

DLC QE1.L923 Vol.49 1994

Pleistocene, Stratigraphy, Peat, Glacial deposits, Quaternary deposits, Correlation, Glacial geology, Poland, Ukraine

53-4515

Changeability of eolian processes in Rostocze Upland and Sandomierz Basin during the Vistulian stage. [Zmienność procesów eolicznych na Rostoczu i w Kotlinie Sandomierskiej podczas piętra Wisły]

Buraczynski, J., *Lublin. Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.51-79, In Polish with English summary. 55 refs.

DLC QE1.L923 Vol.49 1994

Eolian soils, Loess, Sands, Periglacial processes, Wind factors, Sediment transport, Poland

- 53-4516**  
Erosion forms development in the region of southern Bellsund (Spitsbergen). [Rozwój form erozyjnych w rejonie Południowego Bellsundu (Spitsbergen)]  
Gawrysiak, L., Lublin. *Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.123-136 + tables, In Polish with English summary. 12 refs.  
DLC QE1.L923 Vol.49 1994  
Geomorphology, Glacial erosion, Glacial rivers, Meltwater, Water erosion, Moraines, Terraces, Norway—Spitsbergen
- 53-4517**  
Draft of the characteristics of snow-cover in the Bieszczady Mountains. [Zarys charakterystyki pokrywy śnieżnej w Bieszczadach]  
Nowosad, M., Lublin. *Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.197-215, In Polish with English summary. 33 refs.  
DLC QE1.L923 Vol.49 1994  
Snow cover, Snow depth, Snow water content, Snow air interface, Altitude, Poland—Bieszczady Mountains
- 53-4518**  
Soil forming conditions in the arctic region (on the basis of Spitsbergen). [Warunki kształtowania się gleb w obszarze arktycznym (na przykładzie Spitsbergenu)]  
Klimowicz, Z., Uziak, S., Lublin. *Uniwersytet Marii Curie-Skłodowskiej. Annales. Sectio B*, 1994, Vol.49, National Conference of the Polish Geographical Society, 43rd, Lublin, Poland, 1994, p.243-254, In Polish with English summary. 40 refs.  
DLC QE1.L923 Vol.49 1994  
Soil formation, Geocryology, Peat, Alluvium, Soil chemistry, Soil composition, Norway—Spitsbergen
- 53-4519**  
Reconstruction of the past fluctuations of the mass balance and thickness of an ice dome from the annual ice layers. [Rekonstrukcja zmian bilansu masy i tolschiny kupolowidnego lednika v proshlom po godovym sloiam l'da]  
Nikolaev, V.I., Salamatina, A.N., Dudkina, A.V., Klement'ev, O.L., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.3-9, In Russian with English summary. 29 refs.  
DLC GB2401.M37  
Mathematical models, Glacier mass balance, Glacier oscillation, Glacier thickness, Glacier ice, Paleoclimatology, Ice models, Glacier alimentation, Russia—Severnaya Zemlya, Russia—Vavilov Ice Dome
- 53-4520**  
Dynamics of Austfonna, Svalbard: two dimensional modelling of ice motion over a deformable substrate.  
Watts, L.G., Dowdeswell, J.A., Murray, T., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.10-22, With Russian summary. 33 refs.  
DLC GB2401.M37  
Mathematical models, Ice models, Subglacial observations, Isotherms, Boreholes, Ice temperature, Water pressure, Glacier surfaces, Thermodynamics, Sediments, Glacial deposits, Glacier flow, Glacier beds, Norway—Nordaustlandet
- 53-4521**  
Space and time characteristics of the glacial system dynamics in the Arctic and adjacent regions. [Prostranstvenno-vremennye osobennosti dinamiki lednikovyykh sistem Arktiki i priliegaiushchikh raionov]  
Kaluzhina, N.L., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.23-31, In Russian with English summary. 26 refs.  
DLC GB2401.M37  
Glacier surveys, Glacier mass balance, Statistical analysis, Glacier oscillation
- 53-4522**  
Glacier fluctuations and the circulation process changes in the polar regions of the Atlantic and in Europe. [Kolebania lednikov i izmeneniia tsirkulatsionnykh protsessov v poliarnykh raionakh Atlantiki i v Evrope]  
Zakharov, V.G., Khmelevskaia, L.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.32-42, In Russian with English summary. 27 refs.  
DLC GB2401.M37  
Ice air interface, Glacier surveys, Glacier oscillation, Glacier surges, Wind factors, Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Polar atmospheres, Sea ice, Air ice water interaction, Antarctica, Norway—Spitsbergen, Greenland, North Atlantic Ocean, Norwegian Sea, Switzerland—Alps
- 53-4523**  
Interrelation between the air temperature fields and underlying surface in the Central Asia highlands as the basis of the glacial runoff under global climate changes. [Vzaimosviaz' polei' temperatury vozdukh i podstilaushchei poverkhnosti v vysokogor'e TSentral'noi Azii kak osnova prognoza izmeneniï lednikovogo stoka pri global'nykh potepniliakh-pokholodaniakh]  
Lebedeva, I.M., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.43-52, In Russian with English summary. 11 refs.  
DLC GB2401.M37  
Air temperature, Climatic changes, Global warming, Ice air interface, Glacier surfaces, Ice temperature, Surface temperature, Runoff, Glacier melting, Humidity, Temperature inversions, CIS—Central Asia, Pamir-Alay, Himalaya Mountains
- 53-4524**  
Calculation of a runoff from a glacier basin when it is insufficiently studied. [Raschet stoka s lednikovogo basseina pri nedostatochno ego izuchennosti]  
Zhuk, V.A., Kaluzhina, N.L., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.53-58, In Russian with English summary. 8 refs.  
DLC GB2401.M37  
Mathematical models, Runoff forecasting, Accuracy, Mountain glaciers, Moraines, Glacier surfaces, Meltwater, Glacial hydrology, Glacier ablation, Glacier melting, China—Tibet, China—Gongga, Mount
- 53-4525**  
Possible changes of some characteristics of the Pamir-Alay glaciation under the global climate warming. [Vozmozhnye izmeneniia nekotorykh kharakteristik oledeneniia Pamiro-Alaya pri global'nom potepnenii klimata]  
Ananchicheva, M.D., Davidovich, N.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.59-64, In Russian with English summary. 15 refs.  
DLC GB2401.M37  
Global warming, Climatic changes, Mountain glaciers, River basins, Precipitation (meteorology), Climatic factors, Alpine glaciation, Glacier ablation, Glacier alimentation, Forecasting, Ice air interface, Air temperature, Pamir-Alay
- 53-4526**  
Change of the glacial runoff of the Hindu-Kush rivers under the global climate warming. [Izmeneniia lednikovogo stoka rek Gindukusha pri global'nom Potepnenii klimata]  
Lebedeva, I.M., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.65-72, In Russian with English summary. 14 refs.  
DLC GB2401.M37  
Global warming, Climatic changes, Climatic factors, Runoff, Glacial rivers, Glacier ablation, Glacier melting, Ice air interface, Mountain glaciers, Forecasting, Meltwater, Hindu Kush, Afghanistan—Kunduz River, Amu Darya River, Afghanistan—Badakhshan
- 53-4527**  
Structural features of the modern glacierization of the Mongun-Taiga massif. [Osobennosti struktury sovremennogo oledeneniia massiva Mongun-Taiga]  
Moskalenko, I.G., Seliverstov, I.U.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.73-80, In Russian with English summary. 2 refs.  
DLC GB2401.M37  
Mountain glaciers, Glacier surveys, Alpine glaciation, Altitude, Firm, Tannu Ola Mountains, Mongolia, Russia—Tuva
- 53-4528**  
Recent history of the Tuyuksu glaciers. [Nedavnii istoria lednikov Tuluksu]  
Solomina, O.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.81-88, In Russian with English summary. 17 refs.  
DLC GB2401.M37  
Glacier surveys, Mountain glaciers, Lichens, Moraines, Alpine glaciation, Geochronology, Kazakhstan
- 53-4529**  
Manifestations of the congelative ice-formation in the Earth's cryosphere. [Prolavleniia konzheliatsionnogo l'doobrazovaniia v kriosfere Zemli]  
Golubev, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.89-92, In Russian with English summary. 15 refs.  
DLC GB2401.M37  
Classifications, Ice formation, Supercooling, Solifluction, Ice structure, Thermal regime
- 53-4530**  
Permafrost model for the alpine and arid regions. [Model' merzloty dlia vysokogornyykh i aridnykh raionov]  
Krass, M.S., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.93-97, In Russian with English summary. 8 refs.  
DLC GB2401.M37  
Permafrost thermal properties, Thermal regime, Permafrost depth, Permafrost thickness, Ice sublimation, Evaporation, Mathematical models, Frozen ground strength, Mongolia
- 53-4531**  
Modelling of a "marine" glacier and its special zones dynamics. [Modelirovanie dinamiki "morskogo" lednika i ego osobykh zon]  
Vil'chinskii, A.V., Chugunov, V.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.98-104, In Russian with English summary. 8 refs.  
DLC GB2401.M37  
Glacier flow, Ice models, Mathematical models, Glacier ice, Glacier surfaces, Shear stress, Glacier thickness, Antarctica
- 53-4532**  
Boundary layer approximation in anisotropic ice flow modelling.  
Salamatina, A.N., Duval, P., Castelnau, O., Malikova, D.R., *Rossiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.105-111, With Russian summary. 29 refs.  
DLC GB2401.M37  
Anisotropy, Boundary layer, Ice models, Ice mechanics, Rheology, Ice sheets, Glacier ice, Mathematical models, Ice crystal structure, Ice deformation, Shear stress, Antarctica

53-4533

Results of the palynological studies of an ice core from the Vavilov ice dome, Severnaya Zemlya. [Rezultaty palinologicheskikh issledovaniy lednogo kerna s lednikovogo kupola Vavilova, Severnaya Zemlya]

Andreev, A.A., Nikolaev, V.I., Bol'shiyanov, D.I.U., Petrov, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.112-120, In Russian with English summary. 41 refs.

DLC GB2401.M37

Ice cores, Drill core analysis, Palynology, Pollen, Quaternary deposits, Pleistocene, Accuracy, Paleobotany, Taiga, Tundra vegetation, Oxygen isotopes, Russia—Severnaya Zemlya

53-4534

Radio echo-sounding of King George Island ice cap, South Shetland Islands, Antarctica.

Macheret, I.U.I.A., Moskal'skii, M.I.U., Simoes, J.C., Ladouch, L., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.121-128, With Russian summary. 18 refs.

DLC GB2401.M37

Radio echo soundings, Glacier thickness, Ice cover thickness, Subglacial observations, Bedrock, Antarctica—King George Island

53-4535

Short-term climate fluctuations in dynamic of glaciers. [Korotkoperiodnye kolebaniia klimata v dinamike lednikov]

Grigorian, S.S., Krass, M.S., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.129-134, In Russian with English summary. 15 refs.

DLC GB2401.M37

Climatic changes, Climatic factors, Thermal regime, Shear stress, Glacier beds, Glacier surges, Glacier flow, Glacier ablation, Glacier tongues, Glacier alimentation, Glacier oscillation, Antarctica

53-4536

Global climate warming, its manifestation in the Tien Shan and reaction of the glaciers. [Global'noe poteplenie klimata, ego proiavlenie na Tian-Shane i reaktsiia lednikov]

Dikikh, A.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.135-139, In Russian with English summary. 19 refs.

DLC GB2401.M37

Global warming, Global change, Climatic factors, Air temperature, Altitude, Ice air interface, Mountains, Mountain glaciers, Glacier mass balance, Glacier ablation, Kyrgyzstan—Tien Shan

53-4537

Response of the Caucasus and the Alps glaciological systems to climatic changes. [Reaktsiia glatsiologicheskikh sistem Kavkaza i Alp na klimaticheskie izmeneniia]

Khromova, T.E., Chernova, L.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.140-145, In Russian with English summary. 22 refs.

DLC GB2401.M37

Climatic changes, Global warming, Air temperature, Ice air interface, Precipitation (meteorology), Glacier oscillation, Glacier surveys, Glacier mass balance, Glacier ablation, Mountain glaciers, Caucasus, Alps

53-4538

Changes of the Elbrus glaciers during the last century. [Izmeneniia lednikov El'brusa v poslednem stoletii]

Zolotarev, E.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.146-153, In Russian with English summary. 8 refs.

DLC GB2401.M37

Mountain glaciers, Glacier surveys, Glacier oscillation, Glacier tongues, Bedrock, Glacier ablation, Alpine glaciation, Height finding, Georgia—El'brus

53-4539

Interrelation between a glacier thickness and angle of its surface slope. [Vzaimosv'яз' tolshchiny lednika s uglom naklona ego poverkhnosti]

Voitkovskii, K.F., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.155-158, In Russian with English summary. 5 refs.

DLC GB2401.M37

Analysis (mathematics), Glacier thickness, Slope orientation, Shear strain, Shear stress, Ice creep, Glacier surfaces, Glacier flow, Viscous flow, Velocity

53-4540

Interaction of Antarctic ice sheet marginal parts with ocean and atmosphere.

Zakharov, V.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.159-163, With Russian summary. 15 refs.

DLC GB2401.M37

Ice sheets, Air ice water interaction, Glacier oscillation, Glacier surges, Snow accumulation, Air masses, Atmospheric disturbances, Antarctica—East Antarctica, Antarctica—West Antarctica

53-4541

Ice-formation zonality on the Tien Shan glaciers. [Zonal'nost' i doobrazovaniia na lednikakh Tian-Shania]

Vilesov, E.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.164-168, In Russian with English summary. 10 refs.

DLC GB2401.M37

Ice formation, Glacier ice, Glacier surveys, Firn, Glacier ablation, Glacier alimentation, Snow ice, River basins, Ice air interface, Glacier melting, Alpine glaciation, Runoff, China—Tian Shan, CIS—Tien Shan

53-4542

Morpho-sedimentation indications of ancient glaciations in mountain valleys. [Morfo-sedimentatsionnye svidel'stva drevnykh oledeneni' v gornykh dolinakh]

Postolenco, G.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.169-171, In Russian with English summary. 3 refs.

DLC GB2401.M37

Pleistocene, Geomorphology, Glacial geology, Valleys, Alpine glaciation, Outwash, Terraces, Sedimentation, Russia—Ural Mountains

53-4543

Snow-ice formations of the South Kharaulach and Northern Orulgan, Siberia. [Snezhno-lednyie obrazovaniia iuzhnogo Kharaulakha i Severnogo Orulgana]

Sedov, R.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.172-176, In Russian with English summary. 2 refs.

DLC GB2401.M37

Snow ice, Mountain glaciers, Glacier surveys, Snowdrifts, Nivation, River basins, Altitude, Nival relief, Russia—Orulgan Range, Russia—Kharaulakhsy Range, Russia—Lena River, Russia—Siberia

53-4544

Determination of a specific energy for ice destruction under natural conditions. [Opredelenie udel'noi energii razrusheniia l'da v usloviakh estestvennogo zaleganiia]

Epifanov, V.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.177-184, In Russian with English summary. 12 refs.

DLC GB2401.M37

Measuring instruments, Penetrometers, Stresses, Plastic deformation, Ice elasticity, Ice plasticity, Analysis (mathematics), Ice temperature, River ice

53-4545

Firn layer effect upon measurement accuracy of the polar glacier parameters by the method of the wide-angle radio echo-sounding. [Vliianie sloia firna na tochnost' izmereniia parametrov poliarnykh lednikov metodom naklonnogo radiozondirovaniia]

Babenko, A.N., Macheret, I.U.I.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.185-190, In Russian with English summary. 14 refs.

DLC GB2401.M37

Radio echo soundings, Firn, Radio waves, Wave propagation, Accuracy, Glacier surfaces, Analysis (mathematics), Ice density, Glacier thickness

53-4546

Project of the GIS creation of the local type "Lawina (Avalanche)" by the example of the Baksan River valley. [Proekt sozdaniia GIS lokal'nogo tipa "Lavina" na primere doliny r. Baksan]

Volodicheva, N.A., Zolotarev, E.A., Oleinikov, A.D., Chirkov, V.E., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.191-193, In Russian with English summary. 8 refs.

DLC GB2401.M37

Avalanches, Valleys, Data processing, Avalanche protection, Avalanche forecasting, Caucasus—Baksan River

53-4547

Consideration of an avalanche pressure distribution when designing protective constructions. [Uchet raspredeleniia lavinnogo davleniia pri proektirovanii zashchitnykh sooruzhenii]

Iadrosnikov, V.I., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.194-198, In Russian with English summary. 18 refs.

DLC GB2401.M37

Design criteria, Design, Avalanche engineering, Avalanche mechanics, Countermeasures, Avalanche protection

53-4548

Two projects of the deep drilling of the Greenland ice sheet; some results. [Dva proekta glubokogo bureniiia lednikovogo shchita Grenlandii; nekotorye itogi]

Nikolaev, V.I., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.199-209, In Russian with English summary. 58 refs.

DLC GB2401.M37

Ice sheets, Ice cores, Drill core analysis, Oxygen isotopes, Paleoclimatology, Climatic changes, Greenland—Summit

53-4549

Snow cover and glaciers in the works of Vakhushti Bagrationi. [Snezhno-lednikovyi pokrov v rabotakh tzarevicha Vakhushti (Vakhushti Bagrationi)]

Kotliakov, V.M., Gobeidzhishvili, R.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.217-220, In Russian with English summary. 7 refs.

DLC GB2401.M37

Snow cover distribution, Ice cover, Ice conditions, History, Georgia

53-4550

Polar Glaciological Symposium in Moscow in May 1997. [Polarnyi glatsiologicheskii simpozium v Moskve v mae 1997 goda]

Glazovskii, A.F., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, Oct. 1997, Vol.83, p.221-223, In Russian.

DLC GB2401.M37

Meetings, Glaciology, Research projects

## 53-4551

International Conference "Problems of the Earth Cryology (basic and applied studies)". [Mezhdunarodnaia konferentsiia "Problemy kriologii Zemli (fundamental'nye i prikladnye issledovaniia)"] Mel'nikov, E.S., Streletskaia, I.D., Golubev, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.224-226, In Russian.

DLC GB2401.M37

Meetings, Research projects, Geocryology

## 53-4552

Three months in the Institute of Low Temperature Sciences, (Hokkaido University, Sapporo, Japan). [Tri mesiat'sa v Institute nizkoteraturnykh issledovaniï] (Universitet Khokkaido, Sapporo, Iaponiia)]

Salamatin, A.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.227-230, In Russian with English summary. 19 refs.

DLC GB2401.M37

International cooperation, Research projects, Organizations, Paleoclimatology, Drill core analysis, Computer applications, Ice cores, Antarctica—Vostok Station

## 53-4553

Observations on Fridtjof Glacier surge, Svalbard, in 1997. [Nabludenie na podvizhkoï lednika Frîtof na Shpitsberge v 1997 godu]

Zinger, E.M., Zakharov, V.G., Zhidkov, V.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.231-233, In Russian with English summary. 4 refs.

DLC GB2401.M37

Glacier surges, Glacier oscillation, Glacier flow, Glacier surfaces, Glacier ablation, Glacier alimentation, Norway—Svalbard, Norway—Fridtjof Glacier

## 53-4554

Glaciological research at the Galindes Island. [Glatsiologicheskie issledovaniia na ostrove Galindes]

Govorukha, L.S., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.234-235, In Russian. 1 ref.

DLC GB2401.M37

Meetings, Research projects, Glaciology

## 53-4555

International Meeting on Avalanche Problems.

[Mezhdunarodnoe soveshchanie po lavinam] Chernous, P.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Oct. 1997, Vol.83, p.235-236, In Russian.

DLC GB2401.M37

Meetings, Research projects, Avalanches

## 53-4556

Relationship between mountain glacier fluctuations and climatic events. [Sootnoshenie kolebanii gornykh lednikov s klimaticheskimi sobytiïami]

Golubev, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.3-12, In Russian with English summary. 32 refs.

DLC GB2401.M37

Mountain glaciers, Climatic factors, Glacier oscillation, Glacier ablation, Glacier flow, Air temperature, Moraines, Ice relaxation, China—Tibet, New Zealand, Caucasus Mountains, Switzerland—Alps

## 53-4557

Water motion inside a mountain glacier. [Dvizhenie vody v gornom lednike]

Mavliudov, B.R., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.13-17, In Russian with English summary. 16 refs.

DLC GB2401.M37

Mountain glaciers, Subglacial drainage, Ice formation, Ice temperature, Heat transfer coefficient, Crevasses, Glacier ice, Ice water interface, Glacial hydrology

## 53-4558

Temperature coefficient of snow and ice melting on a glacier physical surface. [Temperaturnyi koefitsient talaniia snega i l'da na fizicheskoi poverkhnosti lednikov]

Cherkasov, P.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.18-23, In Russian with English summary. 23 refs.

DLC GB2401.M37

Ice melting, Snow melting, Meltwater, Mountain glaciers, Glacier ablation, Analysis (mathematics), Altitude, Slope orientation, Cloud cover, Snow water equivalent, Glacier ice, Ice temperature, Snow temperature, Albedo, Insolation

## 53-4559

Structural, stratigraphic and geochemical characteristics of the active layer of the Gregoriev Ice Cap, Tien Shan.

Arkhipov, S.M., Mikhailenko, V.N., Thompson, L.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.24-32, With Russian summary. 7 refs.

DLC GB2401.M37

Active layer, Geochemistry, Isotope analysis, Ice cores, Drill core analysis, Oxygen isotopes, Statistical analysis, Firn, Ice composition, Russia—Tien Shan

## 53-4560

Recent glacierization of the Mongun-Taiga massif (Interior Asia) and oroclimatic conditions. [Sovremennoe oledenenie massiva Mongun-Taiga (Vnutrenniaia Azia) i oroklimaticheskie usloviia ego sushchestvovaniia]

Seliverstov, I.U.P., Moskalenko, I.G., Novikov, S.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.33-42, In Russian with English summary. 7 refs.

DLC GB2401.M37

Mountain glaciers, Glacier surveys, Snow line, Topographic effects, Climatic factors, Alpine glaciation, Solar radiation, River basins, Glacial rivers, Russia—Altay Mountains, Russia—Sayan Mountains

## 53-4561

Glacier-dammed lakes in the Siberia mountains: causes and factors of origin and development.

[Glatsiogennoye podprudnye ozera v gorakh Sibiri: prichiny i faktory vozniknoveniia i razvitiia]

Sheinkman, V.S., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.43-50, In Russian with English summary. 53 refs.

DLC GB2401.M37

Glacial lakes, Pleistocene, Glacial geology, Mountain glaciers, Lake bursts, Ice dams, Icebound lakes, Russia—Siberia

## 53-4562

Seasonal icing and water balance of the cryolithic zone river basins. [Sezonnoe oledenenie i vodnyi balans rechnykh basseïnov kriolitsozoni]

Sokolov, B.L., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.51-57, In Russian with English summary. 5 refs.

DLC GB2401.M37

River basins, Water balance, Naleds, Rivers, River flow, Seasonal freeze thaw, Subpermafrost ground water, Hydrology, Russia—Gilyuy River, Russia—Olekma River

## 53-4563

Estimate of icing of the Kodar and Udokan ridges by means of the landscape indication. [Otsenka nalednosti khrebtov Kodar i Udokan metodom landshaftnoi indikatsii]

Alekseev, V.R., Kirichenko, A.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.58-63, In Russian with English summary. 3 refs.

DLC GB2401.M37

Naleds, Landscape types, Altitude, River basins, Valleys, Russia—Transbaikalia, Russia—Udokan Range, Russia—Kodar Range, Russia—Siberia

## 53-4564

Rare case of the avalanche slide in the Elbrus area. [O redkom sluchae skhoda lavin c Priel'brus'e]

Olezhnikov, A.D., Volodicheva, N.A., Goretskii, A.S., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.64-70, In Russian with English summary. 7 refs.

DLC GB2401.M37

Avalanches, Avalanche deposits, Records (extremes), Precipitation (meteorology), Meteorology, Snow depth, Air temperature, Georgia—El'brus

## 53-4565

International Commission on Snow and Ice: historical review. [Mezhdunarodnaia komissia snega i l'da: istoricheskii obzor]

Glazovskii, A.F., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.73-76, In Russian.

DLC GB2401.M37

Meetings, Organizations, Research projects, International cooperation, History

## 53-4566

Results of the glacier fluctuation observations on the former USSR territory. [Itogi nabludenii' za kolebaniiami lednikov na territorii byvshego SSSR]

Kotliakov, V.M., Osipova, G.B., Popovnin, V.V., Tsvetkov, D.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.77-93, In Russian with English captions. 102 refs.

DLC GB2401.M37

Glacier surveys, Glacier oscillation, Glacier mass balance, Russia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan

## 53-4567

Centennial anniversary of the International Commission on Snow and Ice: Symposium on the glacier mass balance (Innsbruck, September 1994). [100-letnii' iubil'ei Mezhdunarodnoi komissii snega i l'da: simpozium po balansu massy lednikov (Innsbruck, sentyabr' 1994 g.)]

Popovnin, V.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.94-102, In Russian.

DLC GB2401.M37

Meetings, International cooperation, Research projects, History, Glacier mass balance

## 53-4568

Towards the second century of the Earth's glacier monitoring. [Vo vtoroe stoletie monitoringa lednikov Zemli]

Popovnin, V.V., Osipova, G.B., Tsvetkov, D.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.103-106, In Russian.

DLC GB2401.M37

Glaciers, Glacier surveys, History, Organizations, International cooperation, Research projects, Meetings

## 53-4569

Monitoring of glacier fluctuations and compilation of the Earth's glaciers inventory. [Monitoring kolebanii i katalogizatsiia lednikov Zemli (global'nyi obzor)]

Popovnin, V.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1997, Vol.82, p.107-115, In Russian with English captions.

DLC GB2401.M37

Glacier oscillation, Glacier surveys, Glacier mass balance, Mountain glaciers

53-4570

Recent publications of the World Glacier Monitoring Service: traditions and progress. [Poslednie publikatsii Vsemirnogo sluzhby monitoringa lednikov: traditsii i progress]

Kotliakov, V.M., Osipova, G.B., Popovnin, V.V., Tsvetkov, D.G., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.125-136, In Russian. 23 refs. DLC GB2401.M37

Glaciers, Organizations, Data processing, Computer applications, International cooperation, Glacier mass balance, Glacier oscillation, Accuracy

53-4571

Mass balance and fluctuations of glacier termini in the Soviet Union in 1987-1991. [Balans massy i kolebaniia kontsov lednikov Sovetskogo Soiuza v 1987-1991 gg.], *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.137-160, In Russian with English captions. 9 refs.

DLC GB2401.M37

Glacier mass balance, Glacier oscillation, Altitude, CIS

53-4572

Snow thickness electrodynamics: the avalanche formation and movement. [Elektrodinamika snezhnoi tolshchi: obrazovanie i dvizhenie lavin] Kazakov, N.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.161-164, In Russian with English summary. 15 refs.

DLC GB2401.M37

Snow cover, Avalanche formation, Avalanche mechanics, Avalanche forecasting, Ice crystals, Snow ice interface, Electromagnetic properties, Ice physics, Dielectric properties, Snow electrical properties, Electric charge

53-4573

Estimation of an avalanche risk. [Otsenka lavinnogo riska] Blagoveshchenskii, V.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.165-167, In Russian with English summary. 4 refs.

DLC GB2401.M37

Avalanche forecasting, Avalanche protection, Analysis (mathematics), Cost analysis, Countermeasures

53-4574

Types of avalanche dangerous territories in the Altai. [Tipy lavinoopasnykh territorii Altaia] Koroleva, T.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.168-174, In Russian with English summary. 12 refs.

DLC GB2401.M37

Avalanches, Avalanche forecasting, Topographic features, Snowfall, Snow depth, Snow cover effect, Avalanche formation, Avalanche tracks, Age determination, Vegetation patterns, Trees (plants), Russia—Aktru River, Russia—Altay Mountains

53-4575

On the number of days with the snow cover on the Greater Caucasus. [O chisle dnei so snezhnym pokrovom na Bol'shom Kavkaze] Pogorelov, A.V., Panova, S.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.175-179, In Russian with English summary. 9 refs.

DLC GB2401.M37

Snow cover distribution, Altitude, Analysis (mathematics), Russia—Caucasus

53-4576

Mudflow wave motions. [Volnovye dvizheniia selevykh potokov] Bozhinski, A.N., Nazarov, A.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.180-183, In Russian with English summary. 7 refs.

DLC GB2401.M37

Mudflows, Mathematical models, Turbulent flow, Wave propagation

53-4577

Catastrophic mudflows in the Elbrus area for the two past millennia. [Katastroficheskie seli Priel'brus'ia za dva poslednikh tysyacheletia] Zolotarev, E.A., Seimova, I.B., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.184-188, In Russian with English summary. 10 refs.

DLC GB2401.M37

Mudflows, Sediments, Quaternary deposits, Moraines, Lichens, Alpine glaciation, Volcanoes, Valleys, Lake bursts, Glacial lakes, Georgia—El'brus, Russia—Baksan River

53-4578

Mudflow activity in the Varzob River basin. [Selevala delatel'nost' v basseine r. Varzob]

Tukeev, O.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.189-192, In Russian with English summary. 7 refs.

DLC GB2401.M37

Mudflows, River basins, Rain, Snowmelt, Altitude, Forecasting, Glaciers, Tajikistan—Varzob River

53-4579

Dynamics of the Kungur cave icing for the 25 years. [Dinamika oledeneniia Kungurskoj peshchery za 25 let]

Mavliudov, B.R., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.193-198, In Russian with English summary. 9 refs.

DLC GB2401.M37

Ice caves, Air temperature, Ice air interface, Ablation, Glaciation, Climatic factors, Ice melting, Russia—Kungur Ice Cave

53-4580

Evaluation of the mountain glaciers response to the global warming (using the south-eastern Alaska as an example). [Otsenka reaktsii gornogo oledeneniia na global'noe poteplenie (na primere I'ugo-vostochnoi Al'aski)]

Davidovich, N.V., Ananicheva, M.D., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.199-205, In Russian with English summary. 8 refs.

DLC GB2401.M37

Mountain glaciers, Global warming, Climatic factors, Air temperature, Climatic changes, Glacier ablation, Glacial hydrology, Carbon dioxide, Forecasting, Glacier melting, Runoff, United States—Alaska

53-4581

Weather of the ablation period in the glacial zone of the Severnaya Zemlya. [Pogoda perioda ablatcii v lednikovoi zone Severnoi Zemli]

Gordechuk, O.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.206-207, In Russian with English summary. 1 ref.

DLC GB2401.M37

Glacier ablation, Glacier ice, Ice air interface, Thermal regime, Glacial meteorology, Russia—Severnaya Zemlya

53-4582

Bedrock of the Franz Josef Land by data of the radio-echo and magnetic sounding. [Korennoi rel'ef Zemli Frantsa-Iosifa po dannym radiolokatsionnoi i magnitnogo zondirovaniia]

Leonov, V.O., Popov, S.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.208-212, In Russian with English summary. 4 refs.

DLC GB2401.M37

Bedrock, Geophysical surveys, Radio echo soundings, Magnetic surveys, Ice cover thickness, Topographic features, Ice conditions, Glacier thickness, Glacier beds, Subglacial observations, Bottom topography, Russia—Franz Josef Land

53-4583

Glaciers of the Chukotka. [Ledniki Chukotki] Sedov, R.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.213-217, In Russian with English summary. 24 refs.

DLC GB2401.M37

Glacier surveys, Moraines, Glacier alimentation, Glacier ablation, Glacier oscillation, Glacier melting, Russia—Chukotskiy Peninsula

53-4584

Glaciers of the Taigonos Peninsula. [Ledniki poluostrova Taigonos]

Sedov, R.V., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.218-221, In Russian with English summary. 5 refs.

DLC GB2401.M37

Glacier surveys, River basins, Moraines, Glacier surfaces, Air temperature, Precipitation (meteorology), Cirque glaciers, Russia—Taygonos Peninsula

53-4585

Annotated list of the Russian language literature on glaciology for 1993. [Annotirovannai bibliografiia russkoiazynnoi literatury po glatsiologii za 1993 god]

Kotliakov, V.M., Chernova, L.P., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.223-238, In Russian. 248 refs.

DLC GB2401.M37

Glaciology, Bibliographies, Ice physics, Ice composition, Snow cover, Avalanches, Sea ice, River ice, Lake ice, Naleds, Ground ice, Glaciers, Paleoclimatology

53-4586

XI-th Glaciological Symposium, May of 1996. [XI Glatsiologicheskii simpozium, mai 1996 g.]

Mikhalev, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.239-246, In Russian.

DLC GB2401.M37

Meetings, Glaciology, Research projects

53-4587

Changing glaciers: International Glaciological Conference in Norway. [Menialushchiesia ledniki: mezhnunarodnaia glatsiologicheskai konferentsiia v Norvegii]

Glazovskii, A.F., Kotliakov, V.M., Mikhalev, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.247-253, In Russian.

DLC GB2401.M37

Meetings, International cooperation, Glaciers, Research projects

53-4588

International conference on the fundamental studies of the Earth's cryosphere in the Arctic and Subarctic, Pushchino. [Mezhnunarodnaia konferentsiia "Fundamental'nye issledovaniia kriosfery Zemli v Arktike i Subarktkike" v Pushchino]

Golubev, V.N., Mel'nikov, E.S., Streletskaia, I.D., Frolov, A.D., Gilichinski, D.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.254-256, In Russian.

DLC GB2401.M37

Meetings, International cooperation, Research projects, Geocryology

53-4589

Working meeting and school-seminar of the Glaciological Association in 1994. [Rabochee soveshchanie i shkola-seminar Glatsiologicheskoi assotsiatsii v 1994 g.]

Bazhev, A.B., Rototava, V.N., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniy*, June 1997, Vol.82, p.257-260, In Russian.

DLC GB2401.M37

Meetings, Organizations, Research projects, Glaciology



53-4590

International conference of snow avalanches. [Mezhdunarodnaya konferentsiya po snezhnym lavinam]

Bozhinskiĭ, A.N., Chernous, P.A., *Rossiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniĭ*, June 1997, Vol.82, p.261-262, In Russian.

DLC GB2401.M37

Meetings, Avalanches, International cooperation, Research projects

53-4591

Ice ages and nuclear waste isolation.

Talbot, C.J., *Engineering geology*, Apr. 1999, 52(3-4), p.177-192, 54 refs.

Radioactive wastes, Waste disposal, Underground storage, Engineering geology, Glaciation, Glacial geology, Glacial erosion, Ice age theory, Global warming, Europe

53-4592

On the feasibility of the acoustic halinometry of the Arctic Ocean.

Kozubskaja, G.I., Kudriashov, V.M., Sabinin, K.D., *Acoustical physics*, Mar.-Apr. 1999, 45(2), p.217-223, Translated from *Akusticheskiĭ zhurnal*. 10 refs.

Sea water, Water temperature, Salinity, Ice water interface, Ice cover effect, Ice acoustics, Underwater acoustics, Sound waves, Sound transmission, Acoustic measurement, Arctic Ocean

53-4593

Winter maintenance: 3 groups provide help. *Better roads*, June 1999, 69(6), p.16-17.

Road icing, Ice removal, Snow removal, Road maintenance

53-4594

Wyoming plows more at safe speeds. MP 5379, *Better roads*, June 1999, 69(6), p.18-19, Phone numbers are provided for S.A. Ketcham, L.D. Minsk, and L.S. Danyluk at CRREL, as contact persons.

Snowstorms, Snow removal, Safety, Cold weather operation, Road maintenance, United States—Wyoming

53-4595

Road supervisors offer winter comments, tips. *Better roads*, June 1999, 69(6), p.20-21.

Snowstorms, Safety, Snow removal, Cold weather operation, Highway planning, Road maintenance, United States

53-4596

How Alaska DOT handles snow and ice. *Better roads*, June 1999, 69(6), p.22-24.

Snow removal, Sanding, Salting, Chemical ice prevention, Road maintenance, United States—Alaska

53-4597

Glaciostasy controls chemical and isotopic characteristics of tholeiites from the Reykjanes Peninsula, SW Iceland.

Gee, M.A.M., Taylor, R.N., Thirwall, M.F., Murton, B.J., *Earth and planetary science letters*, Dec. 15, 1998, 164(1-2), p.1-5, 19 refs.

Glaciation, Glacier oscillation, Isostasy, Volcanoes, Magma, Lithology, Geochemistry, Isotope analysis, Tectonics, Soil dating, Geochronology, Paleoclimatology, Iceland

53-4598

Coherent deep flow variation in the Iceland and American basins during the last interglacial.

Hall, I.R., McCave, T.N., Chapman, M.R., Shackleton, N.J., *Earth and planetary science letters*, Dec. 15, 1998, 164(1-2), p.15-21, 25 refs.

Ocean currents, Water transport, Water temperature, Salinity, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Isotope analysis, Stratigraphy, Global change, Paleoclimatology

53-4599

Deglaciation effects on mantle melting under Iceland: results from the northern volcanic zone.

Slater, L., Jull, M., McKenzie, D., Gronvold, K., *Earth and planetary science letters*, Dec. 15, 1998, 164(1-2), p.151-164, 23 refs.

Glaciation, Glacier oscillation, Glacier melting, Isostasy, Earth crust, Tectonics, Volcanoes, Magma, Geochemistry, Geochronology, Paleoclimatology, Iceland

53-4600

Pleistocene subglacial volcanism in Iceland: tectonic implications.

Bourgeois, O., Dauteuil, O., Van Vliet-Lanoë, B., *Earth and planetary science letters*, Dec. 15, 1998, 164(1-2), p.165-178, 69 refs.

Pleistocene, Glaciation, Glacial geology, Glacier flow, Glacier beds, Volcanoes, Magma, Tectonics, Geochronology, Paleoclimatology, Iceland

53-4601

Provenance of Heinrich layers in core V28-82, northeastern Atlantic:  $^{40}\text{Ar}/^{39}\text{Ar}$  ages of ice-rafted hornblende, Pb isotopes in feldspar grains, and Nd-Sr-Pb isotopes in the fine sediment fraction.

Hemming, S.R., et al, *Earth and planetary science letters*, Dec. 15, 1998, 164(1-2), p.317-333, 58 refs.

Glaciation, Glacial geology, Glacial deposits, Ice rafting, Sediment transport, Marine geology, Marine deposits, Bottom sediment, Drill core analysis, Isotope analysis, Radioactive age determination, Paleoclimatology

53-4602

High-resolution measurements of dissolved organic carbon in the Arctic Ocean by *in situ* fiber-optic spectrometry.

Guay, C.K., et al, *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1007-1010, 28 refs.

Oceanographic surveys, Sea water, Water chemistry, Water temperature, Salinity, Ocean currents, Water transport, Biomass, Nutrient cycle, Arctic Ocean

53-4603

Distribution and inventory of  $^{129}\text{I}$  in the central Arctic Ocean.

Buraglio, N., Aldahan, A.A., Possnert, G., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1011-1014, 20 refs.

Oceanographic surveys, Sea water, Water chemistry, Water temperature, Salinity, Water transport, Ocean currents, Isotopic labeling, Arctic Ocean

53-4604

Numerical investigation of the spring Ross Sea polynya.

Fichefet, T., Goosse, H., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1015-1018, 25 refs.

Sea ice distribution, Ice conditions, Polynyas, Air ice water interaction, Ice heat flux, Drift, Ocean currents, Water transport, Ice models, Computerized simulation, Antarctica—Ross Sea

53-4605

Linkage between decadal climate variations in the Labrador Sea and the tropical Atlantic Ocean.

Yang, J.Y., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1023-1026, 20 refs.

Marine atmospheres, Atmospheric circulation, Air water interactions, Ocean currents, Sea water, Salinity, Water temperature, Surface temperature, Water transport, Global change, Labrador Sea

53-4606

Present and past climate control on fjord glaciations in Greenland: implications for IRD-deposition in the sea.

Reeh, N., Mayer, C., Miller, H., Thomsen, H.H., Weidick, A., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1039-1042, 22 refs.

Glaciation, Glacier oscillation, Glacial geology, Glacial erosion, Glacial deposits, Calving, Icebergs, Ice rafting, Sediment transport, Marine geology, Marine deposits, Bottom sediment, Global change, Climatic changes, Paleoclimatology, Greenland

53-4607

Possible solar influences on the dust profile of the GISP2 ice core from central Greenland.

Ram, M., Stolz, M.R., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1043-1046, 13 refs.

Ice sheets, Glacier ice, Ice cores, Ice composition, Dust, Solar activity, Global change, Paleoclimatology, Greenland

53-4608

Last-glacial to post-glacial  $^{10}\text{Be}$  fluctuations in a sediment core from the Academician Ridge, Lake Balkal.

Horiuchi, K., et al, *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1047-1050, 33 refs.

Lacustrine deposits, Bottom sediment, Drill core analysis, Isotope analysis, Soil dating, Geochronology, Global change, Paleoclimatology, Russia—Baykal, Lake

53-4609

Corrections to "Eurasian snow cover variability and Northern Hemisphere climate predictability".

Cohen, J., Entekhabi, D., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1051, 5 refs. For original paper see 53-3248.

Snow cover distribution, Snowfall, Atmospheric circulation, Climatic changes, Global change, Statistical analysis

53-4610

Temporal evolution of the ratio  $\text{HNO}_3/\text{NO}_x$  in the arctic lower stratosphere from January to March 1997.

Schneider, J., et al, *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1125-1128, 18 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Polar stratospheric clouds, Ozone

53-4611

2D microphysical model of the polar stratospheric CN layer.

Mills, M.J., Toon, O.B., Solomon, S., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1133-1136, 24 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Aerosols, Condensation nuclei, Ice nuclei, Polar stratospheric clouds, Photochemical reactions, Antarctica

53-4612

Stratospheric clouds over England.

Hervig, M.E., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1137-1140, 17 refs.

Polar stratospheric clouds, Clouds (meteorology), Cloud cover, Cloud physics, Aerosols, Ice nuclei, United Kingdom—England

53-4613

Comparison of observations and model simulations of  $\text{NO}_x/\text{NO}_y$  in the lower stratosphere.

Gao, R.S., et al, *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1153-1156, 19 refs.

Stratosphere, Atmospheric composition, Aerosols, Condensation trails, Ozone

53-4614

Partitioning of  $\text{NO}_y$  species in the summer arctic stratosphere.

Osterman, G.B., et al, *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1157-1160, 19 refs.

Polar atmospheres, Stratosphere, Atmospheric composition, Air pollution, Aerosols, Condensation trails, Ozone

53-4615

Satellite detection of smoke aerosols over a snow/ice surface by TOMS.

Hsu, N.C., Herman, J.R., Gleason, J.F., Torres, O., Seftor, C.J., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1165-1168, 9 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Forest fires, Carbon black, Aerosols, Air pollution, Snow optics, Ice optics, Snow cover effect, Ice cover effect, Spaceborne photography, Radiometry, Canada, Greenland

- 53-4616**  
Homogeneous freezing of evaporating cloud droplets.  
Shaw, R.A., Lamb, D., *Geophysical research letters*, Apr. 15, 1999, 26(8), p.1181-1184, 20 refs.  
Cloud physics, Cloud droplets, Evaporation, Homogeneous nucleation, Nucleation rate, Freezing rate
- 53-4617**  
Nonhydrostatic, mesobeta-scale model simulations of cloud ceiling and visibility for an east coast winter precipitation event.  
Stoelinga, M.T., Warner, T.T., *Journal of applied meteorology*, Apr. 1999, 38(4), p.385-404, 22 refs.  
Snowstorms, Snowfall, Snow optics, Cloud cover, Cloud height indicators, Visibility, Weather forecasting, Safety, United States
- 53-4618**  
Carbon fixation by phytoplankton in high arctic lakes: implications of low temperature for photosynthesis.  
Markager, S., Vincent, W.F., Yang, E.P.Y., *Limnology and oceanography*, May 1999, 44(3), p.597-607, 63 refs.  
Lake water, Plankton, Algae, Plant ecology, Biomass, Photosynthesis, Limnology, Canada—Northwest Territories—Queen Elizabeth Islands
- 53-4619**  
Identification of a novel ice-nucleating bacterium of antarctic origin and its ice nucleation properties.  
Obata, H., Muryoi, N., Kawahara, H., Yamada, K., Nishikawa, J., *Cryobiology*, Mar. 1999, 38(2), p.131-139, 28 refs.  
Bacteria, Cryobiology, Ice nuclei, Organic nuclei, Antarctica—Ross Island
- 53-4620**  
On the accuracy of in situ water vapor measurements in the troposphere and lower stratosphere with the Harvard Lyman- $\alpha$  hygrometer.  
Hintsa, E.J., Weinstock, E.M., Anderson, J.G., May, R.D., Hurst, D.F., *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8183-8189, 28 refs.  
Atmospheric composition, Water vapor, Humidity, Moisture detection, Meteorological instruments, Hygrometers, Airborne equipment
- 53-4621**  
Closure of the total hydrogen budget of the northern extratropical lower stratosphere.  
Hurst, D.F., et al, *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8191-8200, 33 refs.  
Atmospheric circulation, Atmospheric composition, Stratosphere, Air masses, Photochemical reactions, Hydrogen, Ozone, Water vapor, Humidity
- 53-4622**  
Chlorine activation and ozone destruction in the northern lowermost stratosphere.  
Lelieveld, J., et al, *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8201-8213, 63 refs.  
Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Cloud physics, Ice nuclei, Air pollution, Aerosols, Ozone
- 53-4623**  
NO<sub>x</sub>-N<sub>2</sub>O correlation observed inside the arctic vortex in February 1997: dynamical and chemical effects.  
Kondo, Y., et al, *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8215-8224, 38 refs.  
Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Air masses, Ice nuclei, Ozone
- 53-4624**  
Six years of UARS Microwave Limb Sounder HNO<sub>3</sub> observations: seasonal, interhemispheric, and interannual variations in the lower stratosphere.  
Santee, M.L., Manney, G.L., Froidevaux, L., Read, W.G., Waters, J.W., *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8225-8246, 86 refs.  
Polar atmospheres, Atmospheric circulation, Atmospheric composition, Polar stratospheric clouds, Ozone, Antarctica
- 53-4625**  
Nitrogen species in the post-Pinatubo stratosphere: model analysis utilizing UARS measurements.  
Danilin, M.Y., *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8247-8262, 77 refs.  
Stratosphere, Atmospheric circulation, Atmospheric composition, Volcanic ash, Ozone
- 53-4626**  
Ozone profiles from GOME satellite data: algorithm description and first validation.  
Hoogen, R., Rozanov, V.V., Burrows, J.P., *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8263-8280, 51 refs.  
Atmospheric circulation, Atmospheric composition, Ozone, Data processing, Computer programs, Mathematical models
- 53-4627**  
Reconstructed view of polar stratospheric chemistry.  
Coffey, M.T., Mankin, W.G., Hannigan, J.W., *Journal of geophysical research*, Apr. 20, 1999, 104(D7), p.8295-8316, 21 refs.  
Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric composition, Polar stratospheric clouds, Photochemical reactions, Ozone
- 53-4628**  
Cold hardiness adaptations of codling moth, *Cydia pomonella*.  
Neven, L.G., *Cryobiology*, Feb. 1999, 38(1), p.43-50, 48 refs.  
Animals, Ecology, Cryobiology, Cold tolerance, Cold weather survival
- 53-4629**  
Ice-nucleating bacteria from the guts of two subantarctic beetles, *Hydromedion sparsutum* and *Perimylops antarcticus* (Perimylopidae).  
Worland, M.R., Block, W., *Cryobiology*, Feb. 1999, 38(1), p.60-67, 22 refs.  
Animals, Bacteria, Cryobiology, Cold tolerance, Cold weather survival, Ice nuclei, Organic nuclei, South Georgia
- 53-4630**  
Temporal changes of microbial assemblages in the ice and snow cover of a high mountain lake.  
Felip, M., Camarero, L., Catalan, J., *Limnology and oceanography*, June 1999, 44(4), p.973-987, 43 refs.  
Frozen lakes, Lake ice, Snow ice interface, Ice cover effect, Snow cover effect, Microbiology, Bacteria, Algae, Ecology, Limnology, Spain—Pyrenees
- 53-4631**  
Analysis of cold air mass temperature modification across the U.S. Great Plains as a consequence of snow depth and albedo.  
Ellis, A.W., Leathers, D.J., *Journal of applied meteorology*, June 1999, 38(6), p.696-711, 28 refs.  
Snow cover distribution, Snow depth, Snow heat flux, Snow cover effect, Albedo, Snow air interface, Air masses, Air temperature, Weather forecasting, United States—Great Plains
- 53-4632**  
Global analysis of snow depth for numerical weather prediction.  
Brasnett, B., *Journal of applied meteorology*, June 1999, 38(6), p.726-740, 31 refs.  
Snow surveys, Snow cover distribution, Snow depth, Snow density, Snowfall, Weather forecasting, Statistical analysis
- 53-4633**  
Double-pyramid structure of dendritic ice growing from supercooled water.  
Borislavsky, I., Lipson, S.G., *Journal of crystal growth*, Mar. 1999, Vol.198/199(Pt.1), International Conference on Crystal Growth, 12th, Part 1, Jerusalem, Israel, July 26-31, 1998. Edited by J.B. Mullin and Gazit, p.56-61, 26 refs.  
Heavy water, Deuterium oxide ice, Dendritic ice, Ice crystal growth, Ice crystal structure
- 53-4634**  
Eutectic freeze crystallization simultaneous formation and separation of two solid phases.  
Van der Ham, F., Witkamp, G.J., De Graauw, J., Van Rosmalen, G.M., *Journal of crystal growth*, Mar. 1999, Vol.198/199(Pt. 1), International Conference on Crystal Growth, 12th, Part 1, Jerusalem, Israel, July 26-31, 1998. Edited by J.B. Mullin and D. Gazit, p.744-748, 6 refs.  
Solutions, Artificial freezing, Ice crystal growth, Liquid solid interfaces, Solidification, Solid phases, Desalting
- 53-4635**  
X-ray topographic studies of dislocation/grain boundary interactions in ice.  
Baker, I., *U.S. Army Research Office. Report*, Oct. 18, 1996, ARO-30421.15-GS, 8p., ADA-318 455, 3 refs.  
Ice crystal structure, Ice deformation, Crystal defects, Dislocations (materials), X ray analysis
- 53-4636**  
Interaction and impact of floating bodies.  
Chwang, A.T., Landweber, L., *Iowa Institute of Hydraulic Research. Report*, July 1992, IIHR-357, 10p., ADA-254 020, 19 refs.  
Ships, Offshore structures, Ice floes, Ice solid interface, Hydrodynamics, Ice loads, Ice pressure, Ice friction, Computerized simulation, Arctic Ocean
- 53-4637**  
Alaska propylene glycol field demonstration.  
Davis, D., *U.S. Army Tank-Automotive RD&E Center (TARDEC) Mobility Technology Center, Belvoir, VA. Technical report*, Mar. 1997, No.13690, 14p. + append., ADA-323 390, 12 refs.  
Motor vehicles, Military equipment, Antifreezes, Air pollution, Environmental protection, Cold weather tests, United States—Alaska—Fairbanks
- 53-4638**  
On the glacial setting of Northern Finland.  
Aario, R., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.3-5, 8 refs.  
DLC GB581.E95 1990  
Glaciation, Glacial geology, Glacial deposits, Glacial erosion, Geomorphology, Paleoclimatology, Finland
- 53-4639**  
Weathering crust in Finnish Lapland and its influence on the composition of glacial deposits.  
Peuraniemi, V., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.7-11, 10 refs.  
DLC GB581.E95 1990  
Glacial geology, Glacial deposits, Glacial till, Bedrock, Weathering, Geochemistry, Minerals, Exploration, Finland—Lapland
- 53-4640**  
Morainic landforms in Northern Finland.  
Aario, R., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.13-27, 25 refs.  
DLC GB581.E95 1990  
Glacial geology, Glacial erosion, Glacial deposits, Glacier flow, Moraines, Glacial till, Geomorphology, Finland
- 53-4641**  
On boulder transport in drumlins, Rogen moraines and Seveti moraines.  
Peuraniemi, V., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.29-32, 7 refs.  
DLC GB581.E95 1990  
Glacial geology, Glacial erosion, Glacial deposits, Glacial till, Moraines, Sediment transport, Finland

53-4642

**Area of Northern Kalnuu, Koillismaa and Peräpohja.**

Aario, R., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.33-49, Refs. passim. List of excursion sites in the area. DLC GB581.E95 1990

Geological surveys, Topographic surveys, Glacial erosion, Glacial erosion, Glacial deposits, Glacial till, Moraines, Geomorphology, Finland

53-4643

**Central Lapland.**

Aario, R., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.49-56, Refs. passim. List of excursion sites in the area. DLC GB581.E95 1990

Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Glacial till, Moraines, Glacier flow, Geomorphology, Stratigraphy, Finland—Lapland

53-4644

**Northern ice flow area.**

Aario, R., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Glacial heritage of Northern Finland; Excursion Guide. Edited by R. Aario, p.57-61, Refs. passim. List of excursion sites in the area. DLC GB581.E95 1990

Geological surveys, Glacial geology, Glacial erosion, Glacial deposits, Glacier flow, Glacial till, Moraines, Finland, Arctic Ocean

53-4645

**From glaciation to the present time.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.63-70, 10 refs.

DLC GB581.E95 1990

Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Isostasy, Glacial lakes, Sea level, Geochronology, Paleoclimatology, Finland, Baltic Sea

53-4646

**Nature conservation in Finland and especially Lapland.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.71-73, 3 refs.

DLC GB581.E95 1990

Regional planning, Environmental protection, Finland—Lapland

53-4647

**Lapland War of 1944-1945.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.75-77, 2 refs.

DLC GB581.E95 1990

Military operation, History, Finland—Lapland

53-4648

**Lapland for tourists.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.79-81, 4 refs.

DLC GB581.E95 1990

Regional planning, Land development, Economic development, Finland—Lapland

53-4649

**Timber line.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.91-93, 8 refs.

DLC GB581.E95 1990

Forest lines, Forest tundra, Plant ecology, Vegetation patterns, Finland

53-4650

**Gold in Lapland.**

Heikkinen, O., *Nordia tiedonantoja. Sarja A*, 1990, No.1, International Drumlin Symposium, Oulu, Finland, June 26-July 2, 1990. Interdisciplinary focus on Northern Finland. Edited by O. Heikkinen, p.95-96, 5 refs.

DLC GB581.E95 1990

Exploration, Gold, Natural resources, Finland

53-4651

**On polygenetic relief in Poland. [Poligeniza rzeźby w Polsce]**

Klatkova, H., ed, *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, 288p., In Polish with extensive English summaries. Refs. passim. For selected papers see 53-4652 through 53-4666.

DLC GB436.P7P65 1996

Geomorphology, Geochronology, Quaternary deposits, Paleoclimatology, Glacial deposits, Landscape development, Landforms, Periglacial processes

53-4652

**Vistulian and Holocene development of the Ozorków environs with reference to the dynamics of the substratum. [Rozwój rzeźby okolic Ozorkowa w wistulianie i holocenie z uwzględnieniem dynamiki podłoża]**

Forysiak, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.33-42, In Polish with English summary. 23 refs.

DLC GB436.P7P65 1996

Quaternary deposits, Eolian soils, Sands, Clays, Glacial deposits, Geomorphology, Geochronology, Substrates, Poland—Ozorków

53-4653

**Polygenesis of the relief of the central part of Polesie Lubelskie: the case of the Sosnowica region. [Poligeniza rzeźby centralnej części Polesia Lubelskiego na przykładzie okolic Sosnowicy]**

Gardziel, Z., Nowak, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.43-53, In Polish with English summary. 26 refs.

DLC GB436.P7P65 1996

Quaternary deposits, Glacial deposits, Pleistocene, Moraines, Geomorphology, Geochronology, Eolian soils, Glacial till, Poland—Sosnowica

53-4654

**Effect of the Warta Stage glacial processes on the Rawka river valley development. [Wpływ warciańskich procesów glacialnych na morfogenezę doliny Rawki]**

Kobojek, E., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.67-78, In Polish with English summary. 22 refs.

DLC GB436.P7P65 1996

Valleys, Geocryology, Geomorphology, Lacustrine deposits, Grain size, Glacial till, Alluvium, Glacial deposits, Glacial rivers, Poland—Rawka River

53-4655

**Influence of cold morphogenetic cycles upon geological structure and morphology of the northern part of Polish Jura Upland. [Wpływ zimnych cykli morfogenetycznych na budowę geologiczną i rzeźbę północnej części Jury Polskiej]**

Kobojek, S., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.79-95, In Polish with English summary. 23 refs.

DLC GB436.P7P65 1996

Pleistocene, Geomorphology, Glacial geology, Geochronology, Periglacial processes, Substrates, Quaternary deposits, Eolian soils, Alluvium, Paleoclimatology, Glacial deposits, Ice wedges, Poland

53-4656

**Litho- and pedogenic features in the tills of the Warta Glaciation (Bełchatów). [Cechy lito- i pedogenezy w glinach zlodowacenia warty (Bełchatów)]**

Konecka-Betley, K., Zagórski, Z., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.97-111 + 1 fold. table, In Polish with English summary. 18 refs.

DLC GB436.P7P65 1996

Soil formation, Glacial till, Cryogenic soils, Soil science, Microstructure, Poland—Bełchatów

53-4657

**Postdepositional stage in the evolution of the Domański Wierch alluvial fan at Orawa (S Poland). [Podepozycyjny etap w rozwoju stożka Domańskiego Wierchu na Orawie]**

Kukulak, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.121-130, In Polish with English summary. 27 refs.

DLC GB436.P7P65 1996

Paleoclimatology, Geomorphology, Geochronology, Terraces, Pleistocene, Alluvium, Tectonics, Climatic changes, Glacial erosion, Landscape development, Poland—Orawa

53-4658

**Main factors of Neogene and Quaternary morphogenetic evolution of the Silesian-Cracow region (S Poland). [Główne czynniki neogenu i czwartorzędowej ewolucji morfogenetycznej regionu śląsko-krakowskiego]**

Lewandowski, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.131-148, In Polish with English summary. 53 refs.

DLC GB436.P7P65 1996

Paleoclimatology, Pleistocene, Quaternary deposits, Tectonics, Periglacial processes, Geomorphology, Glacial geology, Alluvium, Geochronology, Poland—Silesia, Poland—Cracow

53-4659

**Frost weathering of the pre-Quaternary rocks and its influence on landscape evolution in the north-western margin of the Holy Cross Mts. [Wietrzeń mrozowy skał przedczwartorzędowych oraz jego wpływ na rozwój rzeźby północno-zachodniego obrzeżenia Gór Świętokrzyskich]**

Lindner, L., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.149-164, In Polish with English summary. 31 refs.

DLC GB436.P7P65 1996

Frost weathering, Landscape development, Geomorphology, Ground ice, Pleistocene, Sediments, Periglacial processes, Solifluction, Rock mechanics, Frozen rocks, Poland—Holy Cross Mountains, Poland—Cracow

53-4660

Role of buried dead ice in modelling of lake basins in present lakelands. [Rola martwego lodu w kształtowaniu mis jeziornych obecnych pojezierzy]

Marks, L., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.181-192, In Polish with English summary. 58 refs.

DLC GB436.P7P65 1996

Landscape development, Permafrost beneath lakes, Ice melting, Glacial lakes, Lake water, Water level, Hydrology, Climatic changes, Glacial deposits, Peat, Glacier ice, Substrates, Poland

53-4661

Influence of the relief of Warta ice sheet bedrock on the spatial disposition of the deglaciation effects and later transformations of the relief of Rawa Mazowiecka environs. [Wpływ rzeźby podłoża lodolodu warciańskiego na przestrzenny rozkład skutków deglacjacji i późniejsze przekształcenia rzeźby w okolicach Rawy Mazowieckiej]

Rdzany, Z., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.193-205, In Polish with English summary. 17 refs.

DLC GB436.P7P65 1996

Landscape development, Bedrock, Geomorphology, Glacial geology, Paleoclimatology, Ground ice, Melt-water, Ice melting, Poland—Rawa Mazowiecka

53-4662

Polygenesis of Vistulian development of Wieprz drainage basin valleys (Lublin Upland and Roztocze). [Poligeniza wistuliankiego rozwoju dolin dorzecza Wieprza (Wyżna Lubelska i Roztocze)]

Superson, J., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.219-232, In Polish with English summary. 26 refs.

DLC GB436.P7P65 1996

Sediments, Geomorphology, Periglacial processes, Valleys, River basins, Glacial geology, Paleoclimatology, Alluvium, Loess, Poland—Wieprz River, Poland—Lublin

53-4663

Marginal zone of the Wartian ice sheet maximum extent in the eastern part of the Vistula and Bug river interfluvium. [Strefa marginalna maksymalnego zasięgu lodolodu warciańskiego we wschodniej części międzyrzecza Wisły i Bugu]

Terpiłowski, S., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.233-241, In Polish with English summary. 24 refs.

DLC GB436.P7P65 1996

Glacial geology, Paleoclimatology, Ice sheets, Glaciation, Rivers, Geomorphology, Landforms, Landscape development, Glacial deposits, Poland—Bug River, Poland—Vistula River

53-4664

Examples of polygenic valleys in the Łódź Region. [Przykłady dolin poligenicznych w regionie łódzkim]

Turkowska, K., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.243-258, In Polish with English summary. 53 refs.

DLC GB436.P7P65 1996

Valleys, Glaciation, Glacial deposits, Moraines, Landscape development, Alluvium, Periglacial processes, Paleoclimatology, Runoff, Poland—Łódź

53-4665

Spatial and time differentiation of the development of the Łuciąża river valley. [Przestrzenne i czasowe zróżnicowanie rozwoju doliny Łuciąży]

Wachecka-Kotkowska, L., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.259-274, In Polish with English summary. 29 refs.

DLC GB436.P7P65 1996

River basins, Watersheds, Geomorphology, Moraines, Grain size, Sediments, Periglacial processes, Alluvium, Paleoclimatology, Landscape development, Glacial geology, Glacial erosion, Glacial rivers, Poland—Łuciąża River

53-4666

Traces of the Wartian ice sheet oscillation in the eastern part of the region between the Warta and Proсна rivers. [Ślady oscylacji lodolodu warciańskiego we wschodniej części międzyrzecza Warty i Proсны]

Za/bba, M., *Łódzkie Towarzystwo Naukowe. Acta geographica Lodziensia*, 1996, No.71, Poligeniza rzeźby w Polsce (On polygenetic relief in Poland). Edited by H. Klatkova, p.275-288, In Polish with English summary. 22 refs.

DLC GB436.P7P65 1996

Paleoclimatology, Glaciation, Valleys, Glacial erosion, Ice sheets, Sediments, Glacial deposits, Glacier oscillation, Glacial geology, Lacustrine deposits, Landforms, Poland—Warta River, Poland—Proсна River

53-4667

Structural Design '98.

Kujala, P., ed, *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, 208p., Refs. passim. Presented at a seminar held in Espoo, Finland, Mar. 26, 1998. For selected papers see 53-4668 through 53-4678.

Ships, Structural analysis, Hydrodynamics, Design criteria

53-4668

Development of large composite applications in ship building.

Enlund, H., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.8-21, 3 refs.

Ships, Composite materials, Structural analysis, Design criteria

53-4669

Tools for improved FRP-sandwich applicability.

Holm, G., Hildebrand, M., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.22-40, 13 refs.

Ships, Composite materials, Polymers, Plastics, Structural analysis, Strain tests, Computerized simulation, Design criteria

53-4670

Harmonization of polar class ship rules.

Riska, K., Daley, C., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.41-56, 19 refs.

Ships, Ice navigation, Ice solid interface, Metal ice friction, Ice pressure, Ice loads, Standards, Design criteria

53-4671

Modelling of irregular sea waves for the time-domain simulation of ship dynamics.

Matusiak, J., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.57-69, 7 refs.

Ships, Hydrodynamics, Liquid solid interfaces, Ocean waves, Water waves, Structural analysis, Design criteria, Computerized simulation, Mathematical models

53-4672

Wave loads on fast monohulls.

Karppinen, T., Rantanen, A., Hellevara, M., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.70-92, 18 refs.

Ships, Hydrodynamics, Liquid solid interfaces, Ocean waves, Water waves, Structural analysis, Design criteria, Strain tests, Environmental tests, Mathematical models

53-4673

Predictions of design wave loads in ship structural analyses.

Kukkanen, T., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.93-109, 29 refs.

Ships, Hydrodynamics, Liquid solid interfaces, Ocean waves, Water waves, Structural analysis, Fatigue (materials), Design criteria, Mathematical models, Statistical analysis

53-4674

Transport analysis of spar hull structures.

Mikkola, T.P.J., et al, *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.110-128, 9 refs.

Offshore structures, Ships, Marine transportation, Hydrodynamics, Structural analysis, Fatigue (materials), Design criteria, Computerized simulation

53-4675

Laser welding and ship structures.

Kujala, P., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.129-153, 26 refs.

Ships, Steel structures, Panels, Joints (junctions), Lasers, Welding, Structural analysis, Fatigue (materials)

53-4676

Local strength analysis of all steel sandwich panels.

Kujala, P., Naar, H., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.154-174, 12 refs.

Ships, Steel structures, Panels, Structural analysis, Design criteria, Strain tests, Mathematical models, Computerized simulation

53-4677

Active control of vibration—an alternative to ship vibration control?

Vessonen, I., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.175-194, 12 refs.

Ships, Engines, Propellers, Electric equipment, Damping

53-4678

Simplified methods for hierarchical ship structural design.

Holopainen, T., Hakala, M.K., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-238, Structural Design '98. Seminar, Espoo, Finland, Mar. 26, 1998. Edited by P. Kujala, p.195-208, 15 refs.

Ships, Structural analysis, Standards, Design criteria, Mathematical models, Computerized simulation

53-4679

Evaluation of the fully turbulent flow over a flat plate for a large range of Reynolds numbers.

Schweighofer, J., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-226, 133p., PB98-109051, 46 refs.

Ships, Hydrodynamics, Liquid solid interfaces, Boundary value problems, Water flow, Turbulent flow, Viscous flow, Friction, Mathematical models, Computer programs

53-4680

Two-dimensional added mass and damping coefficients by the finite element method.

Kukkanen, T., *Helsinki University of Technology. Ship Laboratory. Report*, 1997, M-223, 61p., PB98-139462, 35 refs.

Ships, Hydrodynamics, Ocean waves, Water waves, Wave propagation, Damping, Liquid solid interfaces, Boundary value problems, Unsteady flow, Mathematical models

53-4681

*Introduction to cold regions engineering* by D.R. Freitag and T. McFadden.

Sodhi, D.S., MP 5380, *Journal of cold regions engineering*, Mar. 1998, 12(1), p.29-30, For book being reviewed see 51-4767.

Cold weather construction, Engineering geology, Frozen ground strength, Frozen ground thermodynamics, Permafrost beneath roads, Permafrost beneath structures, Buildings, Water supply, Sanitary engineering

53-4682

Ice tank tests on ridging of non-uniform ice sheets.

Tuhkur, J., Lensu, M., *Helsinki University of Technology. Ship Laboratory. Arctic Offshore Research Centre. Report*, 1998, M-236, 130p., PB99-141137, 47 refs.

Pressure ridges, Ice pressure, Ice friction, Ice loads, Ice deformation, Ice override, Ice pileup, Ice cover thickness, Environmental tests

53-4683

Polar winter: a biological model for impact events and related dark/cold climatic changes.

Cockell, C.S., Stokes, M.D., *Climatic change*, Feb. 1999, 41(2), p.151-173, Refs. p.169-173.

Ecosystems, Ecology, Cryobiology, Acclimatization, Cold weather survival, Physiological effects, Global change

53-4684

Variations in reconstructed ice winter severity in the western Baltic from 1501-1995, and their implications for the North Atlantic Oscillation.

Koslowski, G., Glaser, R., *Climatic change*, Feb. 1999, 41(2), p.175-191, 25 refs.

Sea ice distribution, Ice conditions, Air ice water interaction, Ocean currents, Atmospheric circulation, Climatic changes, Global change, Statistical analysis, Baltic Sea

53-4685

Northern North American tree-ring evidence for regional temperature changes after major volcanic events.

D'Arrigo, R.D., Jacoby, G.C., *Climatic change*, Jan. 1999, 41(1), p.1-15, 54 refs.

Volcanoes, Volcanic ash, Atmospheric circulation, Air temperature, Forest lines, Plant ecology, Phenology, Climatic changes, Global change

53-4686

Model computations of the impact of climatic change on the windthrow risk of trees.

Peltola, H., Kellomäki, S., Väisänen, H., *Climatic change*, Jan. 1999, 41(1), p.17-36, 50 refs.

Global warming, Frost penetration, Frozen ground strength, Ground thawing, Thaw weakening, Wind pressure, Plant ecology, Trees (plants), Roots, Damage

53-4687

Biomass and metabolism of zooplankton in the Bransfield Strait (Antarctic Peninsula) during austral spring.

Hernández-León, S., Torres, S., Gómez, M., Montero, I., Almeida, C., *Polar biology*, 1999, 21(4), p.214-219, 44 refs.

Marine biology, Animals, Plankton, Ecosystems, Nutrient cycle, Biomass, Antarctica—Bransfield Strait

53-4688

Nutrient stress gradient in the bottom 5 cm of fast ice, McMurdo Sound, Antarctica.

McMinn, A., Skerratt, J.H., Trull, T., Ashworth, C., Lizotte, M.P., *Polar biology*, 1999, 21(4), p.220-227, 47 refs.

Fast ice, Ice bottom surface, Ice water interface, Ice cover effect, Ecology, Ecosystems, Marine biology, Algae, Photosynthesis, Biomass, Nutrient cycle, Antarctica—McMurdo Sound

53-4689

Genetic diversity in the moss *Hennediella heimii* in Miers Valley, southern Victoria Land, Antarctica.

Dale, T.M., Skotnicki, M.L., Adam, K.D., Selkirk, P.M., *Polar biology*, 1999, 21(4), p.228-233, 29 refs.

Mosses, Vegetation patterns, Plant ecology, Plant physiology, Antarctica—Miers Valley

53-4690

Statistical models of invertebrate distribution on Macquarie Island: a tool to assess climate change and local human impacts.

Davies, K.F., Melbourne, B.A., *Polar biology*, 1999, 21(4), p.240-250, 52 refs.

Animals, Biogeography, Ecology, Ecosystems, Acclimatization, Human factors, Environmental impact, Climatic changes, Global warming, Statistical analysis, Macquarie Island

53-4691

Phytoplankton biomass and primary production in the marginal ice zone of the northwestern Weddell Sea during austral summer.

Park, M.G., Yang, S.R., Kang, S.H., Chung, K.H., Shim, J.H., *Polar biology*, 1999, 21(4), p.251-261, 45 refs.

Ice edge, Ice water interface, Ice cover effect, Marine biology, Ecosystems, Plant ecology, Ecology, Plankton, Algae, Chlorophylls, Biomass, Nutrient cycle, Antarctica—Weddell Sea

53-4692

Development of a cirrus parameterization scheme: performance studies in HIRLAM.

Zurovac-Jevtic, D., *Monthly weather review*, Apr. 1999, 127(4), p.470-485, 21 refs.

Clouds (meteorology), Cloud cover, Cloud physics, Homogeneous nucleation, Ice nuclei, Ice crystal growth, Unfrozen water content, Weather forecasting, Mathematical models, Computerized simulation

53-4693

Climatology of collective lake disturbances.

Weiss, C.C., Sousounis, P.J., *Monthly weather review*, Apr. 1999, 127(4), p.565-574, 22 refs.

Snowstorms, Lake effects, Atmospheric circulation, Atmospheric disturbances, Synoptic meteorology, Weather forecasting, Computerized simulation, Great Lakes

53-4694

Segregation of solutes and gases in experimental freezing of dilute solutions: implications for natural glacial systems.

Killawee, J.A., Fairchild, I.J., Tison, J.L., Janssens, L., Lorrain, R., *Geochimica et cosmochimica acta*, Dec. 1998, 62(23/24), p.3637-3655, 74 refs.

Ice formation, Regelation, Ice growth, Freezing front, Ice water interface, Ice composition, Bubbles, Gas inclusions, Meltwater, Water chemistry, Hydrogeochemistry, Geochemistry

53-4695

Quantification of the impact of glacial erosion on the British Isles.

Clayton, K., *Institute of British Geographers. Transactions*, 1996, 21(1), p.124-156, 43 refs.

DLC G1.I67a NS Vol.21 1996

Geological surveys, Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Quaternary deposits, Sediment transport, Geochronology, Paleoclimatology, United Kingdom—England

53-4696

East Antarctic Ice Sheet: unstable ice or unstable ideas?

Sugden, D.E., *Institute of British Geographers. Transactions*, 1996, 21(3), p.443-454, 59 refs.

DLC G1.I67a NS Vol.21 1996

Ice sheets, Glaciation, Glacial geology, Glacier oscillation, Ice age theory, Geomorphology, Geochronology, Tectonics, Sea level, Continental drift, Global change, Paleoclimatology, Antarctica—East Antarctica

53-4697

Secular change of the seasonal sea level variation in the Baltic Sea and secular change of the winter climate.

Ekman, M., *Geophysica*, 1998, 34(3), p.131-140, 18 refs.

Marine atmospheres, Atmospheric circulation, Ocean currents, Air water interactions, Wind direction, Wind factors, Sea level, Climatic changes, Statistical analysis, Baltic Sea

53-4698

Occurrence of unfrozen ground in Finland.

Solantie, R., *Geophysica*, 1998, 34(3), p.141-157, 24 refs.

Snow cover distribution, Snow depth, Snow cover effect, Soil surveys, Forest soils, Forest land, Soil freezing, Frost penetration, Thaw depth, Degree days, Climatic changes, Statistical analysis, Finland

53-4699

Mesoscale dynamics of freezing rain storms over eastern Canada.

Szeto, K.K., Tremblay, A., Guan, H., Hudak, D.R., Stewart, R.E., Cao, Z., *Journal of the atmospheric sciences*, May 15, 1999, 56(10), p.1261-1281, 43 refs.

Ice storms, Snow pellets, Precipitation (meteorology), Fronts (meteorology), Temperature inversions, Cloud physics, Synoptic meteorology, Computerized simulation, Weather forecasting, Canada

53-4700

Modeling of annual water and biogeochemical cycles in a forest basin.

Nazarov, N.A., Leonov, A.V., *Water resources*, Jan.-Feb. 1999, 26(1), p.29-40, Translated from *Vodnye resursy*. 16 refs.

River basins, Watersheds, Forest land, Forest ecosystems, Forest soils, River flow, Stream flow, Runoff, Water pollution, Water chemistry, Hydrogeochemistry, Geochemical cycles, Nutrient cycle, Geochemical cycles, Hydrologic cycle, Water balance, Mathematical models, Computer programs, Russia—Vesla River

53-4701

Effect of valley reservoir water level on the intensity of processes occurring on the water-bottom deposits interface.

Brekhovskikh, V.F., Gashkina, N.A., Lomova, D.V., Shakirova, E.R., *Water resources*, Jan.-Feb. 1999, 26(1), p.48-51, Translated from *Vodnye resursy*. 12 refs.

Reservoirs, Water level, Water chemistry, Hydrogeochemistry, Plankton, Algae, Lacustrine deposits, Bottom sediment, Biomass, Nutrient cycle, Freezing, Ice breakup, Ice cover effect

53-4702

Experimental studies of the structure of flow under ice.

Debol'skaia, E.I., Dolgoplova, E.N., Reshetkov, A.B., *Water resources*, Jan.-Feb. 1999, 26(1), p.86-92, Translated from *Vodnye resursy*. 11 refs.

River ice, Ice cover effect, Ice water interface, River flow, Russia—Moskva River, Russia—Desna River

53-2498

Italian Antarctic Expedition 1996-97. Earth Sciences.

Ricci, C.A., ed, *Terra Antarctica. Reports*, 1998, No.2, 121p., Refs. passim. For selected papers see 53-2499 through 53-2507.

Geophysical surveys, Geological surveys, Marine geology, Marine deposits, Bottom sediment, Glacial geology, Glaciation, Paleoclimatology, Antarctica

53-2499

Research on Cenozoic glacial history in the area between David Basin and Mariner Glacier (Victoria Land).

Baroni, C., Bruschi, G., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.35-38, 14 refs.

Geological surveys, Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Moraines, Lacustrine deposits, Glacier oscillation, Geomorphology, Paleoclimatology, Global change, Geochronology, Antarctica—Victoria Land

53-2500

Seismic investigation of the bottom simulating reflectors on the South Shetland Margin.

Lodolo, E., Tinivella, U., Pellis, G., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.71-74, 4 refs.

Seismic surveys, Exploration, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Hydrates, Antarctica—South Shetland Islands

53-2501

Sediment Drifts of the Antarctic Offshore: Project SEDANO II.

Rebesco, M., Camerlenghi, A., Accerboni, E., Crise, A., Laterza, R., Pudsey, C., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.75-79, 1 ref.

Geophysical surveys, Seismic surveys, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Earth crust, Continental drift, Antarctica—Antarctic Peninsula

53-2502

Southern Chile and Antarctic Peninsula Pacific Margins: Project SCAPPAM-II.

Polonia, A., Brancolini, G., Torelli, L., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.81-88, 6 refs.

Geophysical surveys, Seismic surveys, Marine geology, Bottom sediment, Bottom topography, Tectonics, Earth crust, Continental drift, Geochronology, Tierra del Fuego, Drake Passage

53-2503

Late Cenozoic stratigraphic record from the continental margin of East Antarctica.

De Santis, L., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.89-93, 8 refs.

Research projects, Oceanographic surveys, Marine geology, Marine deposits, Bottom sediment, Geological surveys, Glaciation, Glacial geology, Glacial deposits, Quaternary deposits, Stratigraphy, Paleoclimatology, Antarctica—East Antarctica

53-2504

Geomorphological and glaciological investigations in the Terra Nova Bay area (Victoria Land, Antarctica).

Libera, V., Salvatore, M.C., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.95-97.

Research projects, Geological surveys, Geomorphology, Glacial geology, Frozen lakes, Mapping, Antarctica—Terra Nova Bay

53-2505

Permafrost distribution and ground ice typology and their correlations with periglacial features in northern Victoria Land (Antarctica).

Guglielmin, M., Mannucci, G., Raffi, R., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.99-103, 7 refs.

Permafrost surveys, Permafrost distribution, Permafrost thickness, Permafrost indicators, Ground ice, Periglacial processes, Antarctica—Victoria Land

53-2506

Italian ITASE Expedition from Terra Nova Station to Talos Dome.

Frezzotti, M., Flora, O., Urbini, S., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.105-108, 3 refs.

Expeditions, Traverses, Research projects, Geological surveys, Glacier surveys, Ice cores, Glacier mass balance, Paleoclimatology, Antarctica—Victoria Land

53-2507

Geodetic network in a global reference frame.

Capra, A., *Terra Antarctica. Reports*, 1998, No.2, Italian Antarctic Expedition 1996-97. Earth Sciences. Edited by C.A. Ricci, p.109-113, 3 refs.

Geodetic surveys, Stations, Telemetry equipment, Data transmission, Telecommunication, Spacecraft, Antarctica—Victoria Land

53-2508

Characteristics of large-scale processes in the Norwegian energy-active zone and adjacent areas.

[Zakonomenosti krupnomasshtabnykh protsessov v Norvezhskof zone i prilagayushchikh raionakh]

Alekseev, G.V., ed, Bogorodskii, P.V., ed, St. Petersburg, Gidrometeoizdat, 1994, 214p., In Russian. 102 refs.

Oceanography, Air water interactions, Sea ice, Ice cover effect, Convection, Ocean currents, Enthalpy, Sea water, Water temperature, Salinity, Ice cover thickness, Snow cover effect, Snow depth, Mathematical models, Greenland Sea, Norwegian Sea

53-2509

Vertical distribution of the main salt-forming components in Aral and Caspian sea ice.

Tsytarin, A.G., Skorokhod, A.I., Lisitsyna, L.V., *Water resources*, Nov.-Dec. 1998, 25(6), p.617-622, Translated from Vodnye resursy. 19 refs.

Sea ice, Ions, Ice composition, Salinity, Snow ice, Snow ice interface, Subglacial observations, Ice formation, Brines, Profiles, CIS—Aral Sea, CIS—Caspian Sea

53-2510

Study of the dependence of phytoplankton fineness in a natural water body on the water spatio-bic index: case study of the Yenisey River.

Shchur, L.A., Aponasenko, A.D., Lopatin, V.N., Filimonov, V.S., *Water resources*, Nov.-Dec. 1998, 25(6), p.623-627, Translated from Vodnye resursy. 18 refs.

Plankton, Water pollution, Rivers, Ecosystems, Russia—Yenisey River, Russia—Angara River

53-2511

Response of zooplankton and zoobenthos to changes in the water quality in a sub-Arctic water body: case study of Lake Imandra.

IAkovlev, V.A., *Water resources*, Nov.-Dec. 1998, 25(6), p.658-666, Translated from Vodnye resursy. 32 refs.

Plankton, Water pollution, Environmental impact, Wastes, Water chemistry, Bacteria, Algae, Biomass, Russia—Kola Peninsula, Russia—Imandra Lake, Russia—Belaya Guba Bay

53-2512

Radiometric measurements in the Arctic Ocean—comparison between theory and experiment.

[Radiometrische Messungen im arktischen Ozean—Vergleich von Theorie und Experiment] Johnsen, K.P., *Berichte zur Polarforschung*, 1998, No.297, 119p., In German with English summary. Refs. p.109-119.

Radiometry, Sea ice, Sea ice distribution, Ice cover effect, Snow cover effect, Snow depth, Air ice water interaction, Models, Analysis (mathematics), Brightness, Arctic Ocean, Russia—Kara Sea, Russia—Laptev Sea

53-2513

Patterns and controls of CO<sub>2</sub> fluxes in wet tundra types of the Taimyr Peninsula, Siberia—the contribution of soils and mosses.

Sommerkorn, M., *Berichte zur Polarforschung*, 1998, No.298, 219p., With German summary. Refs. p.173-187.

Carbon dioxide, Tundra, Tundra soils, Tundra vegetation, Mosses, Biomass, Bacteria, Microclimatology, Photosynthesis, Soil physics, Water table, Russia—Taimyr Peninsula, Russia—Labaz, Lake, Russia—Levinson-Lessing, Lake, Russia—Siberia

53-2514

Preliminary study on Quaternary glacial landforms in Mt. Ma'an.

Luo, C.D., *Chinese geographical science*, 1998, 8(1), p.91-95, 3 refs.

Alpine glaciation, Glacial geology, Glacial erosion, Moraines, Quaternary deposits, Geochronology, Paleoclimatology, China—Ma'an, Mount, China—Sichuan Province

53-2515

Features of sea-ice cover, snow distribution and its densification in the central Arctic Ocean.

Xiao, C.D., Qin, D.H., Ren, J.W., *Chinese geographical science*, 1997, 7(4), p.317-327, 15 refs.

Sea ice distribution, Snow ice interface, Snow cover distribution, Snow depth, Snow stratigraphy, Arctic Ocean

53-2516

Environmental changes since Late Pleistocene in estuarine plain of Jiulong River, Fujian Province.

Chen, W.R., Lan, D.Z., Chen, C.H., Zhu, D.K., *Chinese geographical journal*, 1997, 7(4), p.375-382, 5 refs.

Estuaries, Floodplains, Alluvium, Marine geology, Bottom sediment, Sea level, Quaternary deposits, Stratigraphy, Soil dating, Paleoclimatology, China—Fujian Province

53-2517

Biomass and photosynthesis of vascular plants under ice.

Liu, G.C., Cao, Y., *Chinese journal of oceanology and limnology*, 1998, 16(1), p.84-90, 13 refs.

Reservoirs, Frozen lakes, Lake ice, Ice cover effect, Grasses, Plant ecology, Plant physiology, Photosynthesis, Biomass, China

53-2518

Preliminary study on decadal oscillation and its oscillation source of sea-ice-air system in the Northern Hemisphere.

Gao, D.Y., Wu, B.Y., *Chinese journal of atmospheric sciences*, 1998, 22(2), p.112-119, 14 refs.

Sea ice distribution, Ice cover effect, Air ice water interaction, Atmospheric circulation, Climatic changes, Barents Sea, Russia—Kara Sea

53-2519

Comparison of arctic sea ice variation during 1966-1991 between an ocean—sea ice model calculations and observations.

Fang, Z.F., Yu, R.C., Jin, X.Z., *Chinese journal of atmospheric sciences*, 1998, 22(2), p.149-162, 14 refs.

Sea ice distribution, Ice conditions, Ice cover thickness, Ice cover effect, Air ice water interaction, Ice models, Ice heat flux, Atmospheric circulation, Ocean currents, Computerized simulation, Arctic Ocean, Greenland Sea, Barents Sea



53-2520

**Equipment plays key role in airport snow removal.** *Public works*, Dec. 1998, 129(13), p.22-24. Airports, Runways, Snow removal, Snow removal equipment, United States—Missouri—St. Louis, Canada—Ontario—Toronto

53-2521

**Bioventing in shallow tundra overlying permafrost.**

White, D.M., Irvine, R.L., *Journal of soil contamination*, 1998, 7(5), p.599-614, 10 refs.

Permafrost preservation, Tundra soils, Oil spills, Soil pollution, Soil microbiology, Soil chemistry, Aeration, Nutrient cycle, Land reclamation, United States—Alaska

53-2522

**Cold-climate solution.**

Jokela, J.B., Pinks, C., *Civil engineering*, Mar. 1999, 69(3), p.60-63.

Wetlands, Waste treatment, Runoff, Snowmelt, Sedimentation, Snow disposal, Water treatment, Swamps, Ponds, United States—Alaska—Anchorage

53-2523

**Fluidized-bed adsorption bioreactor for the treatment of groundwater contaminated with solvents at low concentration.**

Miyares, P.H., Teeter, C.V., Martel, C.J., SR 99-01, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Jan. 1999, 13p., ADA-359 347, 5 refs.

Ground water, Water pollution, Soil pollution, Environmental impact, Land reclamation, Water treatment, Adsorption, Waste treatment, Soil microbiology, Bacteria, Decomposition  
Volatile organic compounds are a major source of water contamination in the U.S. They pose a threat to the environment and are a potential hazard to human health. Trichloroethylene (TCE) is the most common of these pollutants. TCE is usually remediated through pumping and treating it, using either air stripping or granular activated carbon. Bioremediation is an alternative treatment that uses microbes to convert hazardous substances into nonhazardous compounds. A fluidized bed adsorption bioreactor is examined here for the treatment of groundwater contaminated at low concentrations. This pilot study showed that the packed adsorbent bed could be loaded in approximately 36 hours at a flow rate of 120 mL/min. The remediation phase of the process took approximately 13 days. The reduction in the TCE concentration in the sorbent during each round indicated that it was being remediated by the microbiological process. Areas that need to be improved are the rate of remediation and the loading capacity of the adsorption beds. Currently, each complete cycle of loading and remediating requires 2 weeks while only mineralizing 58 mg of TCE per column.

53-2524

**Spring water temperature as a characteristic feature of karst aquifer behaviour. Examples from the central Pyrenees (NE Spain).**

Freixes, A., Monterde, M., Ramoneda, J., *Hydrogéologie*, 1998, No.1, p.31-40, With French summary. 36 refs.

Karst, Snowmelt, Springs (water), Water temperature, Hydrogeology, Spain—Pyrenees

53-2525

**Airborne DIAL remote sensing of the arctic ozone layer.**

Wirth, M., Renger, W., Ehret, G., *SPIE—The International Society for Optical Engineering. Proceedings*, 1992, Vol.1714, Lidar for Remote Sensing. Edited by R.J. Becherer and C. Werner, p.234-237. DLC QC871.L69 1992

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Ozone, Airborne radar, Lidar

53-2526

**Climatic effects on soil organic phosphorus in the North American Great Plains identified by phosphorus-31 nuclear magnetic resonance.**

Sumann, M., Amelung, W., Haumaier, L., Zech, W., *Soil Science Society of America. Journal*, Nov.-Dec. 1998, 62(6), p.1580-1586, 34 refs.

Nuclear magnetic resonance, Climatic factors, Soil chemistry, Soil composition, Temperature effects, Spectra, Clays, Nutrient cycle, Precipitation (meteorology), Soil microbiology, North America, United States—Great Plains

53-2527

**Properties of permafrost soils on the northern Seward Peninsula, northwest Alaska.**

Höfle, C., Ping, C.L., Kimble, J.M., *Soil Science Society of America. Journal*, Nov.-Dec. 1998, 62(6), p.1629-1639, 43 refs.

Tundra soils, Permafrost, Active layer, Cryogenic structures, Soil classification, Ice wedges, Ice lenses, Tundra vegetation, Frozen ground chemistry, Cryoturbation, United States—Alaska—Seward Peninsula

53-2528

**Optical properties of canopy elements in black spruce, jack pine and aspen stands in Saskatchewan, Canada.**

Middleton, E.M., Walter-Shea, E.A., Mesarch, M.A., Chan, S.S., Rusin, R.J., *Canadian journal of remote sensing*, June 1998, 24(2), p.169-186, With French summary. 38 refs.

Optical properties, Trees (plants), Forest canopy, Forest ecosystems, Spectra, Reflectivity, Remote sensing, Distribution, Canada—Saskatchewan

53-2529

**Use of hyperspectral and biochemical data from black spruce needles to map soils at a forest site in Manitoba.**

Cwick, G.J., Aide, M.T., Bishop, M.P., *Canadian journal of remote sensing*, June 1998, 24(2), p.187-193, With French summary. 15 refs.

Soil mapping, Forest soils, Spectra, Remote sensing, Trees (plants), Soil chemistry, Reflectivity, Statistical analysis, Canada—Manitoba—Thompson

53-2530

**Origin and disposal of potentially contaminated sea ice in the Arctic Ocean.**

Darby, D.A., Bischof, J.F., *Old Dominion University, Norfolk, VA. Applied Marine Research Laboratory. Report*, May 13, 1997, N00014-95-1-1200, 12p. + figs., ADA-326 283, 23 refs.

Suspended sediments, Bottom sediment, Sediment transport, Water pollution, Impurities, Ice composition, Ice rafting, Arctic Ocean, Beaufort Sea, Russia—Laptev Sea

53-2531

**Studies of air-sea-ice interaction.**

Steele, M., *University of Washington, Seattle. Applied Physics Laboratory. Polar Science Center. Report*, May 16, 1997, N00014-90-J-1227, 3p., ADA-325 882, 7 refs.

Research projects, Air ice water interaction, Ice heat flux, Ice cover effect, Atmospheric circulation, Ocean currents, Computerized simulation, Arctic Ocean

53-2532

**Evaluation of the SCAN 16 EF ice detection system.**

Heydrick, C., Brink, R.A., St. John, B., *Pennsylvania Department of Transportation. Bureau of Construction and Materials. Report*, Apr. 1995, FHWA/PA-014-89-65, 23p. + append., PB98-107063.

Road icing, Pavements, Ice detection, Warning systems, Data transmission, Road maintenance, Cost analysis, United States—Pennsylvania

53-2533

**FHWA-SHRP snow and ice control showcasing and implementation. Winter workshops. Participants workbook.**

Strategic Highway Research Program, Washington, D.C., *U.S. Federal Highway Administration. Report*, Mar. 1996, FHWA/SA-96/041, Var. p., PB97-183909.

Road icing, Weather forecasting, Frost forecasting, Ice forecasting, Chemical ice prevention, Salting, Snow fences, Snow removal, Snow removal equipment, Road maintenance, Manuals, United States

53-2534

**Strategies for winter highway maintenance.**

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Snowstorms, Snowfall, Snow removal, Weather forecasting, Safety, Highway planning, Road maintenance

53-2535

**Radiometer measurements of snow in Sodankylä 1991-1993.**

Kurvonen, L., *Helsinki University of Technology. Laboratory of Space Technology. Report*, Sep. 1994, No.16, 98p., PB95-184966, 41 refs.

Snow surveys, Snow cover distribution, Snow water equivalent, Snow surface temperature, Forest land, Vegetation factors, Terrain identification, Radiometry, Finland—Sodankylä

53-2536

**Recycling of useful materials from freezing treatment of industrial wastewaters.**

Okamoto, A., Hamano, M., *Japan Patent Office. Patent*, May 27, 1997, n.p., No.97136079.

Water treatment, Waste disposal, Sewage disposal, Artificial freezing

53-2537

**Ice-melting composition having anti-corrosion properties.**

Wiesenfeld, A., Barbour, J.K., *U.S. Patent Office. Patent*, July 8, 1997, n.p., USP-5,645,755.

Chemical ice prevention, Snow removal, Salting, Corrosion, Road maintenance

53-2538

**Fractionation of halogenated organic matter present in rain and snow.**

Laniewski, K., Borén, H., Grimvall, A., *Chemosphere*, Jan. 1999, 38(2), p.393-409, 33 refs.

Air pollution, Precipitation (meteorology), Scavenging, Snow composition, Snow impurities, Sweden, Poland, Germany, Ireland

53-2539

**Spatial differences of chemical features of atmospheric deposition between rainy season and winter in the areas facing to the Japan Sea, Japan.**

Fukuzaki, N., et al, *Chemosphere*, Jan. 1999, 38(2), p.411-423, 32 refs.

Marine atmospheres, Atmospheric composition, Air pollution, Precipitation (meteorology), Scavenging, Snow composition, Snow impurities, Japan, Japan, Sea

53-2540

**Effect of ice build-up on the soft X-ray response of a charge coupled device (CCD).**

McCarthy, K.J., Owens, A., Spragg, J., Kirkman, I.W., *Nuclear Instruments & methods in physics research A*, Oct. 21, 1998, 416(2-3), p.293-300, 15 refs.

Spacecraft, Sensors, Electronic equipment, Ice accretion, Ice loads, Ice prevention, Defrosting

53-2541

**Vegetation-friendly de-icing composition and method for making it.**

Ossian, K.C., Steinhauer, N.J., *U.S. Patent Office. Patent*, Nov. 4, 1997, n.p., USP-5,683,619.

Road icing, Chemical ice prevention, Plant physiology, Environmental protection, Road maintenance

53-2542

**Glycol-based aircraft anti-icing fluids thickened by associative polymers containing hydrophobe-bearing macromonomers.**

Jenkins, R.D., Bassett, D.R., Lightfoot, R.H., Boluk, M.Y., *U.S. Patent Office. Patent*, Oct. 28, 1997, n.p., USP-5,681,882.

Aircraft icing, Chemical ice prevention

53-2543

**Inorganic hardened body resistant to frost damage for building materials.**

Nitta, K., *Japan Patent Office. Patent*, June 16, 1998, n.p., No.98158053.

Construction materials, Concrete admixtures, Frost resistance, Frost protection

53-4703

**Seismic stratigraphy of the central Bransfield Basin (N/W Antarctic Peninsula): interpretation of deposits and sedimentary processes in a glacio-marine environment.**

Prieto, M.J., Ercilla, G., Canals, M., De Batist, M., *Marine geology*, Apr. 1999, 157(1-2), p.47-68, 53 refs.

Glaciation, Ice sheets, Glacier oscillation, Glacial geology, Glacial erosion, Glacial deposits, Marine geology, Marine deposits, Bottom sediment, Sediment transport, Seismic surveys, Stratigraphy, Tectonics, Geochronology, Antarctica—Bransfield Strait

53-4704

**Facies architecture, seismic stratigraphy and development of a high-latitude basin: the Powell Basin (Antarctica).**

Viseras, C., Maldonado, A., *Marine geology*, Apr. 1999, 157(1-2), p.69-87, 43 refs.

Seismic surveys, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Glacial geology, Glacial deposits, Sediment transport, Sea level, Tectonics, Geomorphology, Stratigraphy, Paleoclimatology, Antarctica—Antarctic Peninsula

53-4705

**Estimating lake area in an arctic landscape using linear mixture modelling with AVHRR data.**

Hope, A.S., Coulter, L.L., Stow, D.A., *International journal of remote sensing*, Mar. 10, 1999, 20(4), p.829-835, 6 refs.

Tundra terrain, Terrain identification, Lakes, Vegetation patterns, Radiometry, Spaceborne photography, Image processing, Statistical analysis, United States—Alaska—North Slope

53-4706

**Dense water formation beneath a time-dependent coastal polynya.**

Chapman, D.C., *Journal of physical oceanography*, Apr. 1999, 29(4), p.807-820, 20 refs.

Polynyas, Air ice water interaction, Wind factors, Ice water interface, Sea water, Water temperature, Salinity, Water transport, Ocean currents, Mathematical models

53-4707

**Isotope tracers in catchment hydrology.**

Kendall, C., ed, McDonnell, J.J., ed, Amsterdam, Netherlands, Elsevier Science B.V., 1998, 839p., Refs. passim. For selected papers see 53-4708 through 53-4717.

DLC GB656.2.R34 I833 1998

Watersheds, Water balance, Hydrologic cycle, Hydrogeochemistry, Runoff, Stream flow, Nutrient cycle, Geochemical cycles, Snow hydrology, Snowmelt, Isotopic labeling, Isotope analysis

53-4708

**Fundamentals of small catchment hydrology.**

Buttle, J.M., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.1-49, Refs. p.43-49.

DLC GB656.2.R34 I833 1998

Watersheds, Snow hydrology, Snowmelt, Runoff, Stream flow, Ground water, Water balance, Isotopic labeling, Isotope analysis

53-4709

**Isotopic variations in precipitation.**

Ingraham, N.L., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.87-118, Refs. p.116-118.

DLC GB656.2.R34 I833 1998

Precipitation (meteorology), Hydrologic cycle, Isotopic labeling, Isotope analysis

53-4710

**Isotopic fractionation in snow cover.**

Cooper, L.W., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.119-136, Refs. p.133-136.

DLC GB656.2.R34 I833 1998

Watersheds, Snow hydrology, Snow composition, Snowmelt, Water chemistry, Hydrogeochemistry, Water balance, Isotopic labeling, Isotope analysis, United States—Alaska—Kuparuk River, United States—Alaska—Toolik Lake

53-4711

**Snow-melt dominated systems.**

Rodhe, A., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.391-433, Refs. p.430-433.

DLC GB656.2.R34 I833 1998

Watersheds, Snow hydrology, Snowmelt, Snow composition, Stream flow, Runoff, Water balance, Hydrogeochemistry, Isotopic labeling, Isotope analysis, Sweden

53-4712

**Use of stable isotopes in evaluating sulfur biogeochemistry of forest ecosystems.**

Mitchell, M.J., Krouse, H.R., Mayer, B., Stam, A.C., Zhang, Y.M., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.489-518, Refs. p.515-518.

DLC GB656.2.R34 I833 1998

Forest ecosystems, Pollution, Nutrient cycle, Geochemical cycles, Isotopic labeling, Isotope analysis, United States—New Hampshire—White Mountains, United States—Maine—Lead Mountain, Canada—Ontario, United States—Rocky Mountains, Germany, Norway, Sweden

53-4713

**Tracing nitrogen sources and cycling in catchments.**

Kendall, C., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.519-576, Refs. p.569-576.

DLC GB656.2.R34 I833 1998

Watersheds, Water pollution, Nutrient cycle, Bacteria, Soil microbiology, Health, Isotopic labeling, Isotope analysis

53-4714

**Carbon cycling in terrestrial environments.**

Wang, Y., et al, Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.577-610, Refs. p.604-610.

DLC GB656.2.R34 I833 1998

Plant physiology, Photosynthesis, Biomass, Soil chemistry, Soil air interface, Nutrient cycle, Geochemical cycles, Isotopic labeling, Isotope analysis, Canada, Antarctica—Fryxell, Lake

53-4715

**Erosion, weathering, and sedimentation.**

Bierman, P.R., et al, Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.647-678, Refs. p.675-678.

DLC GB656.2.R34 I833 1998

Alluvium, Sediment transport, Sedimentation, Soil erosion, Weathering, Soil dating, Soil chemistry, Isotopic labeling, Isotope analysis

53-4716

**Modeling of isotope and hydrogeochemical responses in catchment hydrology.**

Turner, J.V., Barnes, C.J., Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.723-760, Refs. p.758-760.

DLC GB656.2.R34 I833 1998

Watersheds, Water retention, Runoff forecasting, Stream flow, Water balance, Hydrologic cycle, Isotopic labeling, Isotope analysis, Mathematical models

53-4717

**Isotopes as indicators of environmental change.**

Shanley, J.B., et al, Isotope tracers in catchment hydrology. Edited by C. Kendall and J.J. McDonnell, Amsterdam, Netherlands, Elsevier Science B.V., 1998, p.761-816, Refs. p.804-816.

DLC GB656.2.R34 I833 1998

Hydrologic cycle, Atmospheric circulation, Climatic changes, Global change, Paleoclimatology, Global warming, Radioactive age determination, Isotopic labeling, Isotope analysis

53-4718

**Advances in hydrological instrumentation.**

Goyal, V.C., ed, National Workshop on Advances in Hydrological Instrumentation, Oct. 25-26, 1994, New Delhi, India, Allied Publishers Limited, 1997, 245p., Refs. passim. For selected papers see 53-4719 through 53-4725.

DLC GB659.N28 1997

Weather stations, Meteorological instruments, Telemetering equipment, Data transmission, Hydrology

53-4719

**Advances in hydrometeorological instruments, methods of observations and future prospects.**

Kamble, V.P., Upadhyaya, D.S., Sarkar, D., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.8-18, 17 refs.

DLC GB659.N28 1997

Meteorological instruments, Weather observations, Weather forecasting, Meteorological data, Data transmission, Radar, Spaceborne photography, Telemetering equipment, India

53-4720

**Performance of portable automatic weather system and its sensor packages used on the Naradu Glacier, Himalayas.**

Kaul, M.N., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.79-84.

DLC GB659.N28 1997

Glacial meteorology, Weather stations, Meteorological instruments, Telemetering equipment, Meteorological data, Data transmission, Snowfall, Precipitation gages, Himalaya Mountains

53-4721

**Automated snow monitoring system for the Himalayas.**

Ramasastri, K.S., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.111-130, 5 refs.

DLC GB659.N28 1997

Weather stations, Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Snow hydrology, Snowmelt, Runoff forecasting, Himalaya Mountains

53-4722

**Telemetry system for automatic acquisition and transmission of snow and meteorological data and its application.**

Tiwari, A.K., Garg, R.K., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.131-137.

DLC GB659.N28 1997

Weather stations, Meteorological instruments, Telemetering equipment, Data transmission, Snow surveys, Snow survey tools, Avalanche forecasting

## 53-4723

**Data acquisition systems (DAS) for hydrological measurements.**

Goyal, V.C., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.138-147, 8 refs.

DLC GB659.N28 1997

Weather stations, Meteorological instruments, Telemetering equipment, Data transmission, Runoff forecasting, Flood forecasting

## 53-4724

**Streamflow measurements in the mountainous areas.**

Singh, P., Chowdhary, H., Ramasastri, K.S., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.174-183, 7 refs.

DLC GB659.N28 1997

Glacial hydrology, Meltwater, Glacial rivers, River flow, Stream flow, Flow measurement, Runoff forecasting, Himalaya Mountains

## 53-4725

**Newer techniques of watershed measurements.**

Patwary, B.C., Bhunya, P.K., National Workshop on Advances in Hydrological Instrumentation, Roorkee, India, Oct. 25-26, 1994. Edited by V.C. Goyal, New Delhi, India, Allied Publishers Limited, 1997, p.230-237, 8 refs.

DLC GB659.N28 1997

Watersheds, Weather stations, Water reserves, Water balance, Meteorological instruments

## 53-4726

**Cenozoic erosion and the preglacial uplift of the Svalbard-Barents Sea region.**

Dimakis, P., Braathen, B.J., Faleide, J.I., Elverhøi, A., Gudlaugsson, S.T., *Tectonophysics*, Dec. 31, 1998, 300(1-4), Annual Workshop of the ILP Task Force "Origin of Sedimentary Basins", 7th, Torshavn, Faroe Islands, Aug. 1996. Selected papers. Edited by S. Cloetingh, et al. p.311-327, 36 refs. Glaciation, Glacial geology, Glacial erosion, Glacial deposits, Sediment transport, Marine geology, Marine deposits, Bottom sediment, Bottom topography, Isostasy, Tectonics, Geochronology, Stratigraphy, Barents Sea, Norway—Svalbard

## 53-4727

**Gravity wave characteristics in the lower atmosphere at South Pole.**

Pfenninger, M., Liu, A.Z., Papen, G.C., Gardner, C.S., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.5963-5984, 25 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric disturbances, Atmospheric density, Air temperature, Wind (meteorology), Gravity waves, Statistical analysis, Antarctica—South Pole

## 53-4728

**Spatial variability of climate and past atmospheric circulation patterns from central West Antarctic glacioclimatology.**

Reusch, D.B., Mayewski, P.A., Whitlow, S.I., Pittalwala, I.I., Twickler, M.S., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.5985-6001, 40 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Atmospheric composition, Snow composition, Snow ice interface, Glacial meteorology, Glacier ice, Ice cores, Core samplers, Ice composition, Climatic changes, Statistical analysis, Antarctica—West Antarctica

## 53-4729

**Bias correction of daily precipitation measurements for Greenland.**

Yang, D.Q., Ishida, S., Goodison, B.E., Gunther, T., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.6171-6181, 49 refs.

Precipitation (meteorology), Precipitation gages, Weather stations, Meteorological data, Snowfall, Snow accumulation, Snow water equivalent, Statistical analysis, Greenland

## 53-4730

**Tropical aerosol in the Aleutian High.**

Harvey, V.L., Hitchman, M.H., Pierce, R.B., Fairlie, T.D., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.6281-6290, 70 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Atmospheric pressure, Atmospheric composition, Air pollution, Aerosols

## 53-4731

**Simulating the water balance of the Aral Sea with a coupled regional climate-lake model.**

Small, E.E., Sloan, L.C., Hostetler, S., Giorgi, F., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.6583-6602, 40 refs.

Atmospheric circulation, Air water interactions, Air temperature, Water temperature, Surface temperature, Precipitation (meteorology), Evaporation, Ice conditions, Ice cover effect, Climatic changes, Water balance, Computerized simulation, CIS—Aral Sea

## 53-4732

**Impact of tundra ecosystems on the surface energy budget and climate of Alaska.**

Lynch, A.H., Bonan, G.B., Chapin, F.S., III, Wu, W., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.6647-6660, 48 refs.

Tundra climate, Tundra vegetation, Tundra soils, Vegetation patterns, Vegetation factors, Soil air interface, Snow cover effect, Atmospheric circulation, Climatic changes, Heat balance, Computerized simulation, United States—Alaska

## 53-4733

**Modeling clouds and radiation for the November 1997 period of SHEBA using a column climate model.**

Pinto, J.O., Curry, J.A., Lynch, A.H., Persson, P.O.G., *Journal of geophysical research*, Mar. 27, 1999, 104(D6), p.6661-6678, 52 refs.

Polar atmospheres, Marine atmospheres, Atmospheric circulation, Cloud cover, Air ice water interaction, Ice heat flux, Ice cover effect, Radiation balance, Computerized simulation

## 53-4734

**Spatial and temporal variations in snowmelt runoff chemistry, Northwest Territories, Canada.**

Marsh, P., Pomeroy, J.W., *Water resources research*, May 1999, 35(5), p.1559-1567, 37 refs.

Snow cover distribution, Snow samplers, Snow composition, Snow hydrology, Snowmelt, Runoff, Stream flow, Water chemistry, Hydrogeochemistry, Canada—Northwest Territories

## 53-4735

**Simulations of snow distribution and hydrology in a mountain basin.**

Hartman, M.D., et al, *Water resources research*, May 1999, 35(5), p.1587-1603, 56 refs.

Watersheds, Snow cover distribution, Snow hydrology, Snowfall, Snow accumulation, Snow water equivalent, Snow evaporation, Snowmelt, Water balance, Hydrologic cycle, Runoff forecasting, Computerized simulation, United States—Colorado—Rocky Mountain National Park

## 53-4736

**Oriented lake-and-ridge assemblages of the arctic coastal plains: glacial landforms modified by thermokarst and solifluction.**

Grosval'd, M.G., Hughes, T.J., Lasca, N.P., *Polar record*, July 1999, 35(194), p.215-230, 55 refs.

Glaciation, Glacial geology, Ice sheets, Glacial erosion, Glacial deposits, Moraines, Glacial lakes, Thermokarst lakes, Periglacial processes, Solifluction, Geomorphology, Canada—Northwest Territories—Baffin Island, Canada—Northwest Territories—Mackenzie Delta, United States—Alaska, Russia—Siberia

## 53-4737

**Diversity and abundance of soil algae in the polar desert, Sverdrup Pass, central Ellesmere Island.**

Elster, J., Lukesová, A., Svoboda, J., Kopecky, J., Kanda, H., *Polar record*, July 1999, 35(194), p.231-254, Refs. p.252-254.

Glacial deposits, Glacial till, Moraines, Cryogenic soils, Desert soils, Soil microbiology, Algae, Bacteria, Biomass, Plant ecology, Vegetation patterns, Canada—Northwest Territories—Ellesmere Island

## 53-4738

**SCAR bulletin No.134, July 1999.**

Scientific Committee on Antarctic Research, *Polar record*, July 1999, 35(194), p.269-286.

Research projects, International cooperation, Antarctica

## 53-4739

**Seasonal inorganic nitrogen release in alpine lakes on the Colorado western slope.**

Inyan, B.J., Williams, M.W., Tonnessen, K., Turk, J.T., Campbell, D.H., *Physical geography*, Sep.-Oct. 1998, 19(5), p.406-420, 29 refs.

Air pollution, Scavenging, Snow hydrology, Snow impurities, Snow composition, Snowmelt, Lake ice, Ice cover effect, Lake water, Water pollution, Water chemistry, Hydrogeochemistry, Geochemical cycles, United States—Colorado—Rocky Mountains

## 53-4740

**Fatigue of all metal sandwich panels: application for cruise ship longitudinal bulkhead and decks.**

Kujala, P., Kukkanen, T., Kotisalo, K., *Helsinki University of Technology. Ship Laboratory. Report*, 1999, M-237, 52p., 34 refs.

Ships, Steel structures, Panels, Structural analysis, Fatigue (materials), Strain tests, Design criteria, Mathematical models

## 53-4741

**University of the Arctic: turning concept into reality. Phase 1: a development plan.**

Heal, O.W., ed, Langlais, R., ed, Snellman, O., ed, Publications in the University of the Arctic Process, No.1, Rovaniemi, Finland, University of Lapland, International Relations, 1997, 17p., Report submitted to a meeting of senior arctic officials under the Arctic Council in Ottawa, Canada, Oct. 7-9, 1997. Includes Russian version separately paged.

Research projects, Education, Regional planning, International cooperation, Organizations

## 53-4742

**Preprints.**

Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999, Boston, American Meteorological Society, 1999, 562p., Refs. passim. For selected papers see 53-4743 through 53-4772.

Atmospheric circulation, Air temperature, Surface temperature, Precipitation (meteorology), Climatic changes, Paleoclimatology, Global change, Global warming, Statistical analysis, Computerized simulation

## 53-4743

**Inter-decadal climate oscillations along the extra-tropical western coasts of the Americas: evidence from tree rings over the past four centuries.**

Villalba, R., D'Arrigo, R.D., Cook, E.R., Wiles, G.C., Jacoby, G.C., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.13-16, 18 refs.

Marine atmospheres, Surface temperature, Precipitation (meteorology), Plant ecology, Phenology, Climatic changes, Global change

## 53-4744

**Regional climate change in the southeastern US: aerosol cooling vs. greenhouse warming.**

Saxena, V.K., Yu, S.C., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.31-34, 14 refs.

Air temperature, Surface temperature, Air pollution, Aerosols, Heat balance, Climatic changes, Global change, Statistical analysis, United States

53-4745

Upper-air wave trains over the Pacific Ocean and wintertime cold surges in tropical-subtropical South America.

Marengo, J.A., Ambrizzi, T., Kiladis, G., Liebmann, B., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.43-45, 9 refs. Marine atmospheres, Atmospheric circulation, Atmospheric disturbances, Frost, Agriculture, Statistical analysis, Brazil

53-4746

Orbital forcing in paleoclimatic models.

Potemkin, V.L., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.46-47, 6 refs.

Ice age theory, Paleoclimatology, Global change

53-4747

Application of the Model Output Statistics (MOS) technique for forecasting minimum temperatures in the coffee growing areas of southern and south-eastern Brazil.

Kim, I.S., Marengo, J.A., Leal de Quadro, M.F., Dias, N.L., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.51-54, 8 refs.

Air temperature, Frost forecasting, Weather forecasting, Agriculture, Statistical analysis, Brazil

53-4748

Climate perspective of the 1997-98 Laurentian Great Lakes ice cover.

Assel, R.A., Janowiak, J.E., Norton, D.C., O'Connors, C., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.73-76, 3 refs.

Lake ice, Ice conditions, Climatic factors, Global warming, Statistical analysis, Great Lakes

53-4749

Effect of El Niño on the tracks of extratropical cyclones across North America.

Smith, D.R., Ledridge, M.J., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.77-80, 2 refs.

Atmospheric circulation, Atmospheric disturbances, Storms, Long range forecasting, Global change, Statistical analysis, United States

53-4750

Maximum and minimum temperature trends in Canada for 1895-1995 and 1946-1995.

Vincent, L.A., Zhang, X.B., Hogg, W.D., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.95-98, 8 refs.

Air temperature, Surface temperature, Climatic changes, Statistical analysis, Canada

53-4751

Detection of global warming using observed Northern Hemisphere snow cover and sea ice.

Vinnikov, K.I.A., et al, Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.99-100, 11 refs.

Sea ice distribution, Snow cover distribution, Global warming, Statistical analysis, Computerized simulation

53-4752

Variability in cold surge frequency across the United States and southern Canada from a synoptic-climatology perspective.

Notaro, M., Wang, W.C., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.117-118.

Snowstorms, Frost, Air temperature, Synoptic meteorology, Atmospheric circulation, Atmospheric disturbances, Climatic changes, Statistical analysis, United States, Canada

53-4753

Inter-hemisphere comparison of extended winter season conditions in the stratosphere.

Zhou, S.T., Gelman, M.E., Miller, A.J., McCormack, J.P., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.141-142, 3 refs.

Polar atmospheres, Stratosphere, Atmospheric circulation, Ozone

53-4754

Role of solar and volcanic forcing in the Little Ice Age.

Free, M.P., Robock, A., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.269-272, 13 refs.

Solar radiation, Insolation, Volcanic ash, Climatic changes, Global change, Radiation balance, Computerized simulation, Statistical analysis

53-4755

Icehouse effect: a polar autumn and winter cooling trend?

Wetzel, P.J., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.273-276, 6 refs.

Atmospheric circulation, Atmospheric boundary layer, Air ice water interaction, Global change, Ice age theory, Computerized simulation

53-4756

Cloud effects on the near surface air temperature: temporal changes.

Sun, B.M., Groisman, P.I.A., Bradley, R.S., Keimig, F., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.277-281, 4 refs.

Cloud cover, Air temperature, Surface temperature, Snow air interface, Snow cover distribution, Snow cover effect, Climatic changes, Global change, Statistical analysis

53-4757

Ice core evidence for tropical climate change: the role of water vapor.

Thompson, L.G., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.286-289, 22 refs.

Atmospheric circulation, Atmospheric composition, Water vapor, Humidity, Precipitation (meteorology), Ice cores, Paleoclimatology, Global change, Global warming

53-4758

Long-term variability of the North Atlantic Oscillation (NAO).

Stockton, C.W., Glueck, M.F., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.290-293, 11 refs.

Atmospheric circulation, Atmospheric pressure, Atmospheric disturbances, Synoptic meteorology, Climatic changes, Global change, Ice cores, Paleobotany, Phenology, Paleoclimatology

53-4759

Meteorological interpretation of results from antarctic ice cores by using an AGCM under different paleoclimate boundary conditions.

Leckebusch, G.C., Speth, P., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.294-295, 6 refs.

Atmospheric circulation, Atmospheric composition, Aerosols, Dust, Ice cores, Ice composition, Paleoclimatology, Global change, Computerized simulation, Antarctica

53-4760

Precipitation reconstruction in the southern Canadian Cordillera.

Luckman, B.H., Watson, E., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.296-299, 13 refs.

Precipitation (meteorology), Air temperature, Phenology, Paleobotany, Plant ecology, Glacier oscillation, Paleoclimatology, Climatic changes, Statistical analysis, Canada—British Columbia, Canada—Alberta

53-4761

Recent, annually resolved climate as recorded in stable isotope ratios in ice cores from Greenland and Antarctica.

White, J.W.C., Steig, E.J., Cole, J., Cook, E.R., Johnsen, S.J., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.300-302, 5 refs.

Polar atmospheres, Air temperature, Snowfall, Ice cores, Ice composition, Isotope analysis, Climatic changes, Global change, Statistical analysis, Greenland, Antarctica

53-4762

857-year reconstruction of July temperature from Idaho tree rings.

Biondi, F., Perkins, D.L., Cayan, D.R., Berger, W.H., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.307-308, 9 refs.

Air temperature, Phenology, Plant ecology, Paleobotany, Paleoclimatology, Climatic changes, Statistical analysis, United States—Idaho

53-4763

2,000-year paleoclimatic record of drought in the central United States.

Woodhouse, C.A., Overpeck, J.T., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.309-312, 44 refs.

Plains, Precipitation (meteorology), Desiccation, Paleobotany, Phenology, Plant ecology, Climatic changes, Statistical analysis, United States

53-4764

ENSO and NAO: present and 6000 years before present as simulated by the NCAR Climate System Model (CSM).

Otto-Bliesner, B.L., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.313-316, 9 refs.

Atmospheric circulation, Air temperature, Precipitation (meteorology), Insolation, Air ice water interaction, Paleoclimatology, Global change, Computerized simulation

53-4765

Simulations of present and future climate using a coupled ocean-atmosphere GCM without flux adjustments.

Mitchell, J.F.B., et al, Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.363-364, 4 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Ocean currents, Air water interactions, Global warming, Computerized simulation

53-4766

Climate simulations with the DOE Parallel Climate Model (PCM).

Washington, W.M., Weatherly, J.W., MP 5381, Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.365-368, 11 refs.

Atmospheric circulation, Ocean currents, Air ice water interaction, Ice models, Global warming, Computerized simulation

53-4767

**Predictability and variability of North Atlantic and European climate.**

Rodwell, M.J., Rowell, D.P., Folland, C.K., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.395-398, 24 refs.

Marine atmospheres, Atmospheric circulation, Air water interactions, Air temperature, Water temperature, Surface temperature, Long range forecasting, Global change, Computerized simulation

53-4768

**Interannual variability of cold air outbreaks over southern and southeastern Brazil from 1979 to 1997 and sensitivity of the CPTEC/COLA GCM in predicting extreme cases.**

Cavalcanti, I.F.A., Kousky, V.E., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.438-441, 5 refs.

Atmospheric circulation, Atmospheric disturbances, Fronts (meteorology), Synoptic meteorology, Weather forecasting, Frost, Frost forecasting, Computerized simulation, Records (extremes), Brazil

53-4769

**Impacts and climatological assessment of the 1998 northern New York ice storm.**

DeGaetano, A.T., Vreeland, K., Wysocki, M.W., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.450-453, 2 refs.

Ice storms, Cost analysis, Synoptic meteorology, Fronts (meteorology), Precipitation (meteorology), Meteorological data, Statistical analysis, Records (extremes), United States—New York

53-4770

**American River flood frequencies: a climate-society interaction.**

Redmond, K.T., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.454-457, 10 refs.

River flow, Stream flow, Runoff forecasting, Flood control, Flood forecasting, Statistical analysis, Records (extremes), United States—California—American River

53-4771

**Relationships of precipitation and damaging floods in the United States: 1932-1996.**

Pielke, R.A., Jr., Downton, M.W., Mearns, L.O., Cofield, N., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.466-469, 5 refs.

Floods, Accidents, Cost analysis, Precipitation (meteorology), Runoff, Flood forecasting, Statistical analysis, Damage, United States

53-4772

**Transition from NOAA weekly to daily hemispheric snow charts.**

Robinson, D.A., Tarpley, J.D., Ramsay, B.H., Symposium on Global Change Studies, 10th, Dallas, TX, Jan. 10-15, 1999. Preprints, Boston, American Meteorological Society, 1999, p.487-490, 3 refs.

Snow surveys, Snow cover distribution, Snowfall, Mapping, Meteorological charts, Meteorological data, Statistical analysis

53-4773

**Data management for the Coordinated Eastern Arctic Experiment.**

Barry, R.G., Hanson, C.S., U.S. Office of Naval Research. *Arctic Program Report*, Sep. 30, 1992, 6p., ADA-255 648, 3 refs.

Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Data processing, Polar atmospheres, Marine atmospheres, Oceanographic surveys, Arctic Ocean

53-4774

**Antarctic meteorological data, 1997. Vol.38.**

Meteorological data at Syowa Station and Dome Fuji Station. [Nankyoku kisho shiryo 1997 nen Showa kichi oyobi Domu Fuji kansoku kyoten] Japanese Antarctic Research Expedition, 38th (dai-38-ji Nihon Nankyoku chiiki kansokutai), n.p., In Japanese and English. CD-ROM only. Polar atmospheres, Meteorological data, Weather observations, Weather stations, Synoptic meteorology, Solar radiation, Ultraviolet radiation, Radiation measurement, Ozone, Turbidity, Antarctica—Showa Station, Antarctica—Dome Fuji Station

53-4775

**1993-1994 surge of Bering Glacier, Alaska, observed with satellite synthetic aperture radar.**

Roush, J.J., Fairbanks, University of Alaska, 1996, 101p., University Microfilms order No.1379805, M.S. thesis. 51 refs.

Glacier surveys, Glacier oscillation, Glacier flow, Glacier surges, Basal sliding, Glacial lakes, Lake bursts, Synthetic aperture radar, Spaceborne photography, Image processing, United States—Alaska—Bering Glacier

53-4776

**Glacier mass balance bulletin. Bulletin No.5 (1996-1997).**

World Glacier Monitoring Service, Haeberli, W., ed, Hoelzle, M., ed, Frauenfelder, R., ed, Zurich, 1999, 96p.

Mountain glaciers, Glacier surveys, Glacier mass balance, Glacier oscillation

53-4777

**Ice ages.**

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Glaciation, Pleistocene, Paleocology, Paleoclimatology, Global change, Ice age theory

53-4778

**Learning to be circumpolar: experiences in arctic academic cooperation.**

Langlais, R., ed, Snellman, O., ed, Publications in the University of the Arctic Process, No.5, Rovaniemi, Finland, University of Lapland, Circumpolar Universities Association, 1998, 164p., Refs. passim. Research projects, Education, Regional planning, International cooperation, Organizations

53-4779

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Kesitalo, C., Publications in the University of the Arctic Process, No.7, Rovaniemi, Finland, University of Lapland, Circumpolar Universities Association (CUA), May 1999, 29p.

Research projects, Education, Regional planning, International cooperation, Organizations

53-4780

**Evaluation and important properties of corrosion inhibitors used in cold environments.**

Dougherty, J.A., Ahn, Y.S., NACE International, Northern Area, Western Conference, Calgary, Alberta, Mar. 8-11, 1999, Calgary, National Association of Corrosion Engineers International, Northern Area, 1999, 18p., 3 refs.

Crude oil, Pipelines, Pipe flow, Flow control, Surfactants, Corrosion, Cold weather performance, Low temperature tests

53-4781

**Corrosion inhibitor development for offshore gas flowlines.**

Ramachandran, S., Ward, M.B., Bartrip, K.A., Ahn, Y.S., NACE International, Northern Area, Western Conference, Calgary, Alberta, Mar. 8-11, 1999, Calgary, National Association of Corrosion Engineers International, Northern Area, 1999, 20p., 5 refs.

Offshore structures, Gas pipelines, Pipe flow, Flow control, Surfactants, Corrosion, Low temperature tests

53-4782

**Added resistance and unsteady bow wave field of a ship in short waves.**

Kalske, S., *Acta polytechnica Scandinavica. Mechanical engineering series*, 1998, No.133, 96p., Ph.D. thesis to be defended at the Helsinki University of Technology. 54 refs.

Ships, Hydrodynamics, Liquid solid interfaces, Ocean waves, Water waves, Wave propagation, Boundary value problems, Mathematical models, Computerized simulation

53-4783

**Arctic '96: RV *Polarstern* trafficability report.**

Lensu, M., Helsinki University of Technology. *Ship Laboratory. Arctic Offshore Research Centre. Report*, 1998, M-235, 163p., 9 refs.

Icebreakers, Oceanographic ships, Ice navigation, Ice breaking, Ice conditions, Ice cover thickness, Trafficability

53-4784

**Alaska Army lands withdrawal renewal: final legislative environmental impact statement.**

Richardson, U.S. Army Alaska (USARAK), [1999], 2 vols., Refs. p.6/1-6/30. Prepared by the Center for Ecological Management of Military Lands, Colorado State University, Fort Collins, CO.

Military facilities, Military operation, Regional planning, Environmental impact, Soil pollution, Water pollution, Land reclamation, Environmental protection, Cost analysis, Legislation, United States—Alaska

53-4785

**Mechanisms for pressure-induced amorphization of ice I<sub>h</sub>.**

Tse, J.S., et al, *Nature*, Aug. 12, 1999, 400(6745), p.647-649, 24 refs.

Amorphous ice, High pressure ice, Ice density, Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Phase transformations

53-4786

**Relative influences of atmospheric chemistry and transport on arctic ozone trends.**

Chipperfield, M.P., Jones, R.L., *Nature*, Aug. 5, 1999, 400(6744), p.551-554, 24 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Polar stratospheric clouds, Ozone, Computerized simulation, Antarctica

53-4787

**Local short-range prediction of cloud images of weather radar by a hybrid neural network method. [Niyuraru nettowaku-ho o mochi ita koukosetsu reda gazo no kyokusho tanjikan yosoku]**

Maeda, N., Amenomori, M., *Seppyo*, May 1999, 61(3), p.197-205, In Japanese with English summary. 5 refs.

Cloud cover, Clouds (meteorology), Precipitation (meteorology), Snowfall, Snowstorms, Weather forecasting, Radar tracking, Image processing, Computerized simulation, Japan

53-4788

**Model of layered ice-formation in unconfined water-saturated spherical glass particles. [Garasu funryutai naka no sojo hyosetsu moderu]**

Watanabe, K., Mutou, Y., Mizoguchi, M., *Seppyo*, May 1999, 61(3), p.207-214, In Japanese with English summary and captions. 15 refs.

Soil freezing, Soil water migration, Ice lenses, Freezing front, Freezing rate

53-4789

**Physical properties of snow and ice under cosmic and planetary environment. [Uchu-wakusei kanryo ni okeru seppyo bussel]**

Arakawa, M., *Seppyo*, May 1999, 61(3), p.215-220, In Japanese. 11 refs.

Extraterrestrial ice, Satellites (natural), Planetary environments

53-4790

Development of an automatic ice fabric analyzer. Part 1: determination of c-axis orientation by a new image analysis. [Aisu faburikku jido kaiseki sochi no kaihatsu. Dai-1 ho: gazo kaiseki ni yoru ichijikusei kessho shujiku hoi sokuteiho]

Wang, Y., Azuma, N., Kamimura, S., *Seppyo*, Mar. 1999, 61(2), p.115-126, In Japanese with English Summary. 8 refs.

Ice structure, Ice crystal structure, Ice crystal optics, Ice crystal replicas, Photographic techniques, Image processing, Mathematical models

53-4791

Development of an automatic ice fabric analyzer. Part 2: automatic analysis of ice fabric and texture by image-processing technique. [Aisu faburikku jido kaiseki sochi no kaihatsu. Dai-2 ho: gazo kaiseki ni yoru kessho ryukei oyobi shujiku hoi no jido kaiseki]

Wang, Y., Azuma, N., *Seppyo*, Mar. 1999, 61(2), p.127-138, In Japanese with English Summary. 5 refs.

Ice structure, Ice crystal structure, Ice crystal optics, Ice crystal size, Ice crystal replicas, Photographic techniques, Image processing, Mathematical models

53-4792

Reforestation on snow avalanche site in northern Hokkaido. [Hokkaido hokubu no nadare hassei-chi ni okeru shinrin zosei]

Matsuda, K., Yajima, T., Shibuya, M., *Seppyo*, Mar. 1999, 61(2), p.139-147, In Japanese with English summary. 11 refs.

Revegetation, Trees (plants), Protective vegetation, Land reclamation, Snow hedges, Snow stabilization, Snow retention, Slope protection, Avalanche engineering, Japan—Hokkaido

53-4793

Interferometric observation of salt concentration distribution in liquid phase around THF clathrate hydrate during directional growth. [Ippoko gyoko naka no THF haidoreto kinbo ni okeru ekiso enbun nodo bunpu no kokansho sokutei]

Nagashima, K., Yamamoto, Y., Furukawa, Y., *Seppyo*, Mar. 1999, 61(2), p.149-154, In Japanese. 16 refs.

Hydrates, Clathrates, Natural gas, Fuels, Frozen liquids, Liquid solid interfaces, Phase transformations, Crystal growth, Solidification, Salinity

53-4794

Characterization of antitank firing ranges at CFB Valcartier, WATC Wainwright and CFAD Dundurn.

Thiboutot, S., et al, MP 5382, Canada. Defence Research Establishment Valcartier, Quebec. Report, Oct. 1998, DREV-R-9809, 54p., ADA-356 304, With French summary. 17 refs.

Military facilities, Site surveys, Explosives, Soil pollution, Ground water, Water pollution, Soil tests, Soil analysis, Chemical analysis, Canada

Some operational activities of the Canadian Forces such as firing practice may cause the dispersion of energetic compounds in the environment. These compounds should be closely monitored due to their highly specific physical, chemical and toxicological properties. In Canada, limited effort has been spent to examine this particular environmental threat. In this context, the characterization of many firing ranges potentially contaminated with explosives has been performed during the last few years. Air-to-ground ranges and ground-to-ground ranges have been characterized and, in general, low levels of multi-contamination by explosives were found. However, antitank firing ranges sampled showed high levels of contamination by HMX, a high explosive used in many antitank rockets. This report details the characterization of five antitank ranges located at Canadian Forces Base Valcartier, Western Area Training Center Wainwright and Canadian Forces Ammunition Depot, Dundurn. The sampling and analytical methods are described and the results are presented. This work should help the Canadian Forces to pursue their operational activities, while minimizing the impacts on the environment by providing a better comprehension of the source of contamination and helping to minimize the environmental impacts in the future.

53-4795

Indentation of model scale pressure ridges with a vertical indenter.

Tuhkuri, J., Riska, K., Wilhelmson, M., Kennedy, R., McCarthy, S., *Helsinki University of Technology. Ship Laboratory. Arctic Offshore Research Centre. Report*, 1997, M-230, 63p., PB98-145162, 13 refs. Pressure ridges, Ice cover strength, Ice solid interface, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Penetration tests, Environmental tests

53-4796

Dynamics of the Ice Age Earth: a modern perspective.

Wu, P., ed, *GeoResearch Forum*, Vols.3-4, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, 637p., Refs. passim. For individual papers see 53-4797 through 53-4827.

Glaciation, Ice sheets, Glacier oscillation, Glacial geology, Ice age theory, Isostasy, Earth crust, Rheology, Geodesy, Tectonics, Global change, Sea level

53-4797

Birth and development of the concept of glacio-isostasy, and its modelling up to 1974.

Lilbourn, L., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.1-15, 63 refs. Glaciation, Glaciology, Glacial geology, Ice age theory, Rheology, Geodesy, Earth crust, Continental drift, Tectonics, Isostasy

53-4798

Global glacial isostasy and relative sea level: implications for solid earth geophysics and climate system dynamics.

Peltier, W.R., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.17-53, 66 refs. Glaciation, Glacial geology, Ice age theory, Paleoclimatology, Rheology, Geodesy, Viscoelasticity, Earth crust, Continental drift, Tectonics, Isostasy, Sea level, Global change, Ice models, Mathematical models

53-4799

Gravitational-viscoelastic field theory.

Wolf, D., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.55-85, 58 refs. Rheology, Viscoelasticity, Earth crust, Tectonics, Geodesy, Isostasy, Mathematical models

53-4800

Load-induced viscoelastic relaxation: an elementary example.

Wolf, D., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.87-104, 36 refs. Rheology, Viscoelasticity, Earth crust, Tectonics, Geodesy, Isostasy, Mathematical models

53-4801

Significance of pre-stress advection and internal buoyancy in the flat-earth formulation.

Purcell, A., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.105-121, 20 refs. Rheology, Geodesy, Earth crust, Tectonics, Isostasy, Mathematical models

53-4802

Effects of compressibility and stratification on viscoelastic relaxation: the analytical perspective.

Vermerssen, L.L.A., Sabadini, R., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.123-134, 18 refs. Rheology, Viscoelasticity, Earth crust, Tectonics, Geodesy, Isostasy, Mathematical models

53-4803

Initial-value approach for viscoelastic responses of the Earth's mantle.

Hanyk, L., Matyska, C., Yuen, D.A., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.135-153, 46 refs.

Rheology, Viscoelasticity, Earth crust, Tectonics, Geodesy, Isostasy, Mathematical models

53-4804

Static deformation of the outer core.

Fang, M., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.155-189, 35 refs. Earth crust, Geodesy, Rheology, Isostasy, Mathematical models

53-4805

Validity of using flat-earth finite element models in the study of postglacial rebound.

Wu, P., Johnston, P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.191-201, 18 refs. Glaciation, Glacial geology, Ice age theory, Earth crust, Tectonics, Geodesy, Isostasy, Computerized simulation

53-4806

Viscoelastic channel flow.

O'Keefe, K., Wu, P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.203-216, 36 refs. Glaciation, Glacial geology, Ice age theory, Isostasy, Earth crust, Tectonics, Geodesy, Rheology, Viscoelasticity, Mathematical models

53-4807

Dynamics of the Pleistocene ice sheets.

Marshall, S.J., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.217-248, 142 refs. Pleistocene, Ice age theory, Glaciation, Ice sheets, Glacial geology, Glacier oscillation, Glacier flow, Glacier friction, Glacier beds, Basal sliding, Glacier surges, Ice rafting, Isostasy, Global change, Geochronology, Paleoclimatology, Mathematical models

53-4808

How to model the waxing and waning of ice sheets.

Lilbourn, L., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.249-269, 32 refs. Pleistocene, Ice age theory, Glaciation, Ice sheets, Ice shelves, Glacier oscillation, Glacier flow, Glacier mass balance, Glacier heat balance, Basal sliding, Global change, Paleoclimatology, Ice models, Mathematical models

53-4809

Tutorial on strategies for using isostatic adjustments in models that reconstruct ice sheets during the last deglaciation.

Hughes, T.J., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.271-321, 108 refs. Ice age theory, Glaciation, Glacial geology, Ice sheets, Glacier flow, Glacier friction, Basal sliding, Glacier oscillation, Geodesy, Earth crust, Tectonics, Isostasy, Global change, Paleoclimatology, Ice models, Mathematical models, Computerized simulation

53-4810

Inferences on mantle rheology from creep laws.

Ranalli, G., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.323-339, 76 refs. Earth crust, Rheology, Geodesy, Tectonics, Creep, Isostasy, Mathematical models



53-4811

**Plausible mantle rheology.**  
Lliboutry, L., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.341-350, 17 refs. Earth crust, Rheology, Geodesy, Tectonics, Isostasy, Glacier ice, Ice creep, Mathematical models

53-4812

**Micro-physics of post glacial rebound.**  
Karato, S.I., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.351-364, 36 refs. Earth crust, Rheology, Geodesy, Tectonics, Creep, Microstructure, Dislocations (materials), Glacial geology, Isostasy, Mathematical models

53-4813

**Postglacial rebound modeling with power-law rheology.**

Wu, P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.365-382, 20 refs. Glaciation, Glacial geology, Ice age theory, Earth crust, Rheology, Tectonics, Geodesy, Sea level, Isostasy, Ice models, Mathematical models

53-4814

**Recent postglacial rebound of Fennoscandia: a short review and some numerical results.**

Ekman, M., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.383-392, 18 refs. Glaciation, Glacial geology, Marine geology, Sea level, Isostasy, Earth crust, Tectonics, Geodetic surveys, Norway, Sweden, Finland

53-4815

**Evidence of late Holocene post-glacial isostatic adjustment in coastal wetland deposits of eastern North America.**

Donnelly, J.P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.393-399, 30 refs. Glaciation, Glacial geology, Marine geology, Wetlands, Swamps, Bottom sediment, Isostasy, Tectonics, Global change, Sea level

53-4816

**Comparison between postglacial isostatic predictions and late Holocene sea-level field data from Mediterranean and Iranian coastal areas.**

Pirazzoli, P.A., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.401-419, 50 refs. Glaciation, Glacial geology, Marine geology, Global change, Isostasy, Tectonics, Sea level

53-4817

**Postglacial sea level variations in the far field of the ice sheets: glacial cycle effects on present-day secular sea level change.**

Peltier, W.R., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.421-441, 25 refs. Glaciation, Ice sheets, Ice age theory, Glacial geology, Glacier oscillation, Marine geology, Isostasy, Earth crust, Tectonics, Global change, Sea level, Computerized simulation

53-4818

**Rheological structure of the upper mantle inferred from the Holocene sea-level change along the west coast of Kyushu, Japan.**

Okuno, J., Nakada, M., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.443-458, 35 refs. Glaciation, Glacial geology, Marine geology, Earth crust, Rheology, Tectonics, Isostasy, Global change, Sea level, Japan

53-4819

**Postglacial rebound and other influences on the Earth's secular rotation rate, from analysis of ancient eclipse records.**

Pang, K.D., Yau, K.K., Chau, H.H., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.459-488, 109 refs. Glaciation, Ice age theory, Glacial geology, Earth crust, Rheology, Geodesy, Tectonics, Isostasy, Global change

53-4820

**Mantle layering and long-term rotational response of the Earth to glacial cycles.**

Sabadini, R., Vermeersen, L.L.A., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.489-496, 41 refs. Glaciation, Ice age theory, Glacial geology, Earth crust, Geodesy, Tectonics, Isostasy, Global change, Computerized simulation

53-4821

**Geodetic techniques for estimating changes in polar ice.**

Wahr, J., Han, D., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.497-508, 22 refs. Ice sheets, Glacier oscillation, Glacier mass balance, Glacial geology, Glacier surveys, Geodetic surveys, Topographic surveys, Earth crust, Tectonics, Isostasy, Global change, Sea level, Greenland, Antarctica

53-4822

**Verification of the solid earth response on changing ice loads: a geodetic project in West Greenland.**

Dietrich, R., Scheinert, M., Korth, W., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.509-522, 19 refs. Ice sheets, Glacier surveys, Glacier oscillation, Glacier mass balance, Glacial geology, Geodetic surveys, Gravimetric prospecting, Earth crust, Tectonics, Isostasy, Global change, Sea level, Greenland

53-4823

**Secular variations in the Earth's gravitational field from analysis of SLR data.**

Cheng, M.K., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.523-531, 27 refs. Glacial geology, Earth crust, Tectonics, Isostasy, Geodetic surveys, Gravimetric prospecting, Lidar, Spaceborne photography

53-4824

**Use of satellite laser ranging and long duration orbital changes to constrain geophysical models.**

Klosko, S., Chao, B.F., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.533-556, 50 refs. Glacier oscillation, Glacier mass balance, Glacial geology, Earth crust, Tectonics, Isostasy, Global change, Sea level, Geodetic surveys, Gravimetric prospecting, Lidar, Spaceborne photography

53-4825

**Postglacial rebound with lateral heterogeneities: from 2D to 3D modeling.**

Wu, P., Ni, Z., Kaufmann, G., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.557-581, 24 refs. Glaciation, Ice sheets, Glacier oscillation, Glacial geology, Ice age theory, Earth crust, Tectonics, Geodesy, Isostasy, Ice models, Computerized simulation

53-4826

**Upper mantle lateral viscosity variations and postglacial rebound: application to the Barents Sea.**

Kaufmann, G., Wu, P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.583-601, 24 refs.

Glaciation, Ice sheets, Glacier oscillation, Glacial geology, Ice age theory, Marine geology, Earth crust, Geodesy, Tectonics, Isostasy, Global change, Sea level, Ice models, Computerized simulation, Barents Sea

53-4827

**Intraplate earthquakes and postglacial rebound in eastern Canada and northern Europe.**

Wu, P., *GeoResearch Forum*, Vols.3-4. Dynamics of the Ice Age Earth: a modern perspective. Edited by P. Wu, Zurich, Switzerland, Trans Tech Publications Ltd., 1998, p.603-628, 56 refs.

Glaciation, Ice sheets, Glacial geology, Earth crust, Tectonics, Isostasy, Earthquakes, Seismology, Computerized simulation

53-4828

**Soils and groundwater pollution and remediation: Asia, Africa, and Oceania.**

Huang, P.M., ed, Iskandar, I.K., ed, MP 5383, Boca Raton, FL, CRC Press LLC, 1999, 386p., Refs. passim. Chapters 3 and 4, p.80-95, and 96-125, respectively, have p.82-95 and 96-114 missing, and 115-125 duplicated. Chapter 5, p.126-149, is complete but has p.126-146 duplicated in chapters 3 and 4.

DLC TD878.4.A78S65 1999

Soil pollution, Ground water, Water pollution, Waste disposal, Environmental impact, Health, Environmental protection, Land reclamation

53-4829

**Evidence of NO<sub>x</sub> production within or upon ice particles in the Greenland snowpack.**

Honrath, R.E., Peterson, M.C., Guo, S., Dibb, J.E., Shepson, P.B., Campbell, B., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.695-698, 26 refs. Snow air interface, Scavenging, Snow surface, Snow composition, Photochemical reactions, Polar atmospheres, Atmospheric composition, Greenland

53-4830

**Nitric acid adsorption on ice: surface diffusion.**

Laird, S.K., Buttry, D.A., Sommerfeld, R.A., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.699-701, 18 refs.

Snow ice interface, Snow composition, Snow permeability, Ice composition, Ice surface, Adsorption, Vapor diffusion

53-4831

**Variation of the infrared spectra of nitric acid hydrates with formation conditions: impact on PSC identification.**

Tisdale, R.T., Prenni, A.J., Iraci, L.T., Tolbert, M.A., Toon, O.B., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.707-710, 14 refs.

Polar atmospheres, Atmospheric composition, Polar stratospheric clouds, Cloud physics, Aerosols, Ice nuclei, Ice crystal optics, Ice spectroscopy, Infrared spectroscopy

53-4832

**Ozone and temperature profiles measured above Kiruna inside, at the edge of, and outside the arctic polar vortex in February and March 1997.**

Kreher, K., Bodeker, G.E., Kanzawa, H., Nakane, H., Sasano, Y., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.715-718, 14 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air temperature, Polar stratospheric clouds, Ozone, Sweden

53-4833

Spring 1996 and 1997 ozonesonde measurements over McMurdo Station, Antarctica.

Nardi, B., Bellon, W., Oolman, L.D., Deshler, T., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.723-726, 13 refs.

Polar atmospheres, Atmospheric composition, Air temperature, Ozone, Sounding, Telemetering equipment, Data transmission, Antarctica—McMurdo Station

53-4834

Potential high-latitude vegetation feedbacks on CO<sub>2</sub>-induced climate change.

Levis, S., Foley, J.A., Pollard, D., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.747-750, 22 refs.

Vegetation patterns, Vegetation factors, Plant physiology, Evapotranspiration, Carbon dioxide, Atmospheric composition, Atmospheric circulation, Global warming, Computerized simulation

53-4835

Interfacial water in polar glaciers and glacier sliding at -17°C.

Cuffey, K.M., Conway, H., Hallet, B., Gades, A.M., Raymond, C.F., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.751-754, 19 refs.

Glacier flow, Glacier friction, Glacier beds, Regeneration, Water films, Basal sliding, Antarctica—Meserve Glacier

53-4836

Twentieth century trends in droughts in southern Switzerland.

Rebetez, M., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.755-758, 19 refs.

Precipitation (meteorology), Meteorological data, Desiccation, Climatic changes, Global warming, Statistical analysis, Switzerland

53-4837

Northern Hemisphere temperatures during the past millennium: inferences, uncertainties, and limitations.

Mann, M.E., Bradley, R.S., Hughes, M.K., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.759-762, 16 refs.

Air temperature, Surface temperature, Paleobotany, Forest lines, Ice cores, Paleoclimatology, Climatic changes, Global change, Statistical analysis

53-4838

Unified structure in Quaternary climate.

Gauthier, J.H., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.763-766, 28 refs.

Ice age theory, Solar activity, Global change, Paleoclimatology, Statistical analysis

53-4839

Estimating present-day postglacial rebound and horizontal movements in Fennoscandia by repeated GPS campaigns in 1993 and 1997.

Pan, M., Sjöberg, L.E., *Geophysical research letters*, Mar. 15, 1999, 26(6), p.771-774, 15 refs.

Marine geology, Sea level, Tides, Geodetic surveys, Earth crust, Tectonics, Isostasy, Sweden, Finland

53-4840

Rock glaciers and springs in the "Niedere Tauern" (Styria). [Blockgletscher und Quellen in den Niederen Tauern]

Untersweg, T., Schwendt, A., *Österreichische Geologische Gesellschaft, Wien. Mitteilungen*, 1994(Pub. May 96), No.87, p.47-55, In German with English summary. 14 refs.

DLC QE1.A38 BD.87 1994

Rock glaciers, Glacial hydrology, Periglacial processes, Ground water, Springs (water), Austria—Styria

53-4841

Experimental and computational simulation of in-flight icing phenomena.

Kind, R.J., Potapczuk, M.G., Feo, A., Golia, C., Shah, A.D., *Progress in aerospace sciences*, 1998, 34(5/6), p.257-345, 154 refs.

Aircraft icing, Ice accretion, Ice detection, Ice forecasting, Supercooled clouds, Cloud droplets, Environmental tests, Wind tunnels, Design criteria, Safety

53-4842

Problems of application of homogeneous maximum flood peak method to the analysis of maximum seasonal flows. [Problemy związane ze stosowaniem genetycznych ciągów maksymalnych kulminacji w analizie maksymalnych przepływów sezonowych]

Węglarczyk, S., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1996, 19(2), p.55-65, In Polish with Russian and English summaries. 15 refs.

DLC QC869.4.P63 W56 No.19 1996

Flood forecasting, Snowmelt, Meltwater, Rain, Poland

53-4843

Seventy-fifth anniversary of Maritime Branch of Institute of Meteorology and Water management. [Siedemdziesiąt pięć lat działalności Oddziału Morskiego Instytutu Meteorologii i Gospodarki Wodnej]

Dziadziuszko, Z., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1996, 19(3), p.3-26, In Polish with Russian and English summaries. 10 refs.

DLC QC869.4.P63 W56 No.19 1996

Organizations, Research projects, Meteorology, Hydrology, History, Poland

53-4844

Current ecological problems of the Baltic Sea. [Sytuacja ekologiczna współczesnego Bałtyku]

Trzosińska, A., Lysiak-Pastuszak, E., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1996, 19(3), p.27-62, In Polish with Russian and English summaries. 51 refs.

DLC QC869.4.P63 W56 No.19 1996

Water pollution, Sea water, Ecosystems, Water chemistry, Oil spills, Wastes, Ocean currents, Environmental impact, Baltic Sea

53-4845

Polish contribution to the total pollution input to the Baltic Sea. [Udział Polski w dopływie zanieczyszczeń do Morza Bałtyckiego]

Niemirycz, E., Bogacka, T., Taylor, R., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1996, 19(3), p.63-84, In Polish with Russian and English summaries. 4 refs.

DLC QC869.4.P63 W56 No.19 1996

Water pollution, Sea water, Environmental impact, Rivers, River flow, Water chemistry, Baltic Sea

53-4846

On using geochemical data in the paleo-geographical studies of Gdańsk Bay. [Próba wykorzystania danych geochemicznych w badaniach paleo-geograficznych Zatoki Gdańskiej]

Kepińska, U., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1996, 19(3), p.101-121, In Polish with Russian and English summaries. 37 refs.

DLC QC869.4.P63 W56 No.19 1996

Paleoclimatology, Bottom sediment, Geochemistry, Lithology, Marine geology, Poland—Gdańsk Bay

53-4847

Arctic research of the United States, Vol.13, Spring/Summer 1999.

U.S. Interagency Arctic Research Policy Committee, Myers, C.E., ed, Korsmo, F., ed, Haugh, J., ed, Cate, D.W., ed, Valliere, D.R., ed, MP 5384, Arlington, VA, U.S. National Science Foundation, Office of Polar Programs, 1999, 54p., Refs. passim. For selected papers see 53-4848 and 53-4849.

Organizations, Research projects, Regional planning, International cooperation

53-4848

Old records, new stories: ecosystem variability and subsistence hunting in the Bering Strait area.

Krupnik, I., *Arctic research of the United States*, Spring/summer 1999, Vol.13, p.15-24, 8 refs.

Research projects, Regional planning, Human factors, Ecosystems, Environmental protection, Bering Strait

53-4849

Traditional knowledge and radionuclides.

Craver, A., Cochran, P., Kruse, J., *Arctic research of the United States*, Spring/summer 1999, Vol.13, p.49-54.

Research projects, Regional planning, Pollution, Health, Ecosystems

53-4850

University of the Arctic. The feasibility study: final report. With shared voices: launching the University of the Arctic.

Young, O.R., ed, Langlais, R., ed, Snellman, O., ed, Publications in the University of the Arctic Process, No.6, Rovaniemi, Finland, University of Lapland, Circumpolar Universities Association (CUA), 1998, 67p., With Russian version p.14-24.

Research projects, Education, Regional planning, International cooperation, Organizations

53-4851

Thermal tendencies of winters in Poland as the indicator of climate variability. [Tendencje termiczne zim w Polsce jako wskaźnik oceny zmienności klimatu]

Lorenc, H., Suwalska-Bogucka, M., *Instytut meteorologii i gospodarki wodnej. Wiadomości*, 1995, 18(1), p.3-28, In Polish with Russian and English summaries. 37 refs.

DLC QC869.4.P63 W56 No.18 1995

Global warming, Climatic changes, Air temperature, Atmospheric pressure, Solar activity, Winter, Poland

53-4852

Assessment of foliar frost damage: a comparison of *in vivo* chlorophyll fluorescence with other viability tests.

Neuner, G., Buchner, O., *Journal of applied botany*, May 1999, 73(1-2), p.50-54, With German summary. 30 refs.

Plant ecology, Plant physiology, Plant tissues, Chlorophylls, Cold exposure, Cold tolerance, Frost resistance

53-4853

Sensitivity experiments performed with an energy balance atmosphere model coupled to an advection-diffusion ocean model.

Bintanja, R., *Theoretical and applied climatology*, 1997, 56(1-2), p.1-24, Refs. p.22-24.

Atmospheric circulation, Ocean currents, Air ice water interaction, Snow air interface, Ice cover effect, Snow cover effect, Radiation balance, Global change, Mathematical models, Computerized simulation

53-4854

Spatial variability in the chemical composition of the snowcover at high alpine sites.

Schöner, W., Puxbaum, H., Staudinger, M., Maupeit, F., Wagenbach, D., *Theoretical and applied climatology*, 1997, 56(1-2), p.25-32, 16 refs.

Atmospheric composition, Atmospheric circulation, Air pollution, Scavenging, Snow cover distribution, Snow composition, Snow impurities, Snow samplers, Alps

53-4855

Vertical radar reflectivity profiles in Slovenia.

Rakovec, J., *Theoretical and applied climatology*, 1997, 57(1-2), p.35-47, 32 refs.

Cloud physics, Cloud droplets, Water content, Precipitation (meteorology), Snowfall, Radar echoes, Weather forecasting, Mathematical models, Slovenia

## 53-4856

**Statistical study of winter lightning strikes to aircraft with electric field of the ground surface.** Tomine, K., Ogata, H., Fukawatase, K., *National Defense Academy, Yokosuka, Japan. Memoirs. Mathematics, physics, chemistry and engineering*, Mar. 1998, 37(2), p.1-9, 14 refs.  
Thunderstorms, Lightning, Cloud physics, Cloud electrification, Atmospheric electricity, Aircraft, Accidents, Weather forecasting, Statistical analysis, Japan

## 53-4857

**Laboratory astrophysics and space research.** Ehrenfreund, P., ed, Krafft, C., ed, Kochan, H., ed, Pirronello, V., ed, *Astrophysics and Space Science Library*, Vol.236, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, 687p., Refs. passim. For selected papers see 53-4858 through 53-4862.  
DLC QB461.L3 1999  
Cosmic dust, Planetary environments, Extraterrestrial ice, Ice composition, Ice sublimation, Molecular structure

## 53-4858

**Interstellar medium: a general introduction.** Spaans, M., Ehrenfreund, P., *Astrophysics and Space Science Library*, Vol.236. Laboratory astrophysics and space research. Edited by P. Ehrenfreund, C. Krafft, H. Kochan, and V. Pirronello, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.1-36, Refs. p.32-36.  
DLC QB461.L3 1999  
Cosmic dust, Molecular structure, Extraterrestrial ice, Ice composition, Ice sublimation

## 53-4859

**Laboratory astrophysics in solar system studies—an overview.** Cruikshank, D.P., *Astrophysics and Space Science Library*, Vol.236. Laboratory astrophysics and space research. Edited by P. Ehrenfreund, C. Krafft, H. Kochan, and V. Pirronello, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.37-67, Refs. p.60-67.  
Planetary environments, Satellites (natural), Cosmic dust, Extraterrestrial ice, Ice composition, Environment simulation

## 53-4860

**Ices in the interstellar medium.** Schutte, W.A., *Astrophysics and Space Science Library*, Vol.236. Laboratory astrophysics and space research. Edited by P. Ehrenfreund, C. Krafft, H. Kochan, and V. Pirronello, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.69-103, Refs. p.98-103.  
Cosmic dust, Extraterrestrial ice, Ice composition, Ice spectroscopy, Ice sublimation, Ice vapor interface, Molecular structure, Phase transformations

## 53-4861

**Water ice on comets and satellites.** Bernstein, M.P., *Astrophysics and Space Science Library*, Vol.236. Laboratory astrophysics and space research. Edited by P. Ehrenfreund, C. Krafft, H. Kochan, and V. Pirronello, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.105-120, Refs. p.117-120.  
Cosmic dust, Planetary environments, Satellites (natural), Extraterrestrial ice, Ice composition, Ice structure, Ice density, Ice sublimation, Molecular structure, Phase transformations

## 53-4862

**Simulation experiments with cometary analogous material.** Kochan, H.W., Huebner, W.F., Sears, D.W.G., *Astrophysics and Space Science Library*, Vol.236. Laboratory astrophysics and space research. Edited by P. Ehrenfreund, C. Krafft, H. Kochan, and V. Pirronello, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.623-665, Refs. p.658-665.  
Cosmic dust, Planetary environments, Extraterrestrial ice, Ice composition, Ice sublimation, Environment simulation

## 53-4863

**Chemical ozone loss in the arctic vortex in the winter 1995-96: HALOE measurements in conjunction with other observations.** Müller, R., et al, *Annales geophysicae*, Jan. 1999, 17(1), p.101-114, 56 refs.  
Polar atmospheres, Atmospheric circulation, Atmospheric composition, Ozone

## 53-4864

**Aspects of the freezing process in a porous material-water system. Part 1. Freezing and the properties of water and ice.** Chatterji, S., *Cement and concrete research*, Apr. 1999, 29(4), p.627-630, 19 refs.  
Concrete freezing, Concrete durability, Concrete strength, Frost action, Frost resistance, Freeze thaw tests

## 53-4865

**Water invasion, freezing, and thawing in cementitious materials.** Ausloos, M., Salmon, E., Vandewalle, N., *Cement and concrete research*, Feb. 1999, 29(2), p.209-213, 28 refs. Paper presented at the Materials Research Society Symposium on Advances in Materials for Cementitious Composites, Boston, MA, Dec. 1-3, 1997.  
Concrete freezing, Concrete durability, Concrete strength, Frost resistance, Freeze thaw tests

## 53-4866

**Can thin disk-like ice clusters be more stable than compact droplet-like ice clusters?** Tanaka, H., Yamamoto, R., Koga, K., Zeng, X.C., *Chemical physics letters*, May 7, 1999, 304(5-6), p.378-384, 16 refs.  
Water structure, Molecular structure, Molecular energy levels, Hydrogen bonds, Ice crystal structure

## 53-4867

**Winter temperature variability during warming and cooling periods in the conterminous United States, 1947-1992.** Yin, Z.Y., Knapp, P.A., *Theoretical and applied climatology*, 1999, 62(3-4), p.109-124, 44 refs.  
Atmospheric circulation, Air temperature, Air masses, Surface temperature, Climatic changes, Global warming, Statistical analysis, United States

## 53-4868

**Spatial, temporal and intensity characteristics of heavy snowfall events over Austria.** Spreitzhofer, G., *Theoretical and applied climatology*, 1999, 62(3-4), p.209-219, 33 refs.  
Snowstorms, Snowfall, Snow surveys, Snow cover distribution, Snow depth, Weather forecasting, Statistical analysis, Mathematical models, Austria

## 53-4869

**Solar system ices.** Schmitt, B., ed, De Bergh, C., ed, Festou, M., ed, *Astrophysics and Space Science Library*, Vol.227, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, 826p., Refs. passim. Based on reviews presented at the International Symposium on Solar System Ices, Toulouse, France, Mar. 27-30, 1995. For individual papers see 53-4870 through 53-4901.  
DLC QB462.6.S654 1998  
Planetary environments, Satellites (natural), Cosmic dust, Extraterrestrial ice, Ice composition, Ice sublimation, Ice spectroscopy, Ice structure, Ice thermal properties, Atmospheric composition, Clathrates, Hydrates, Molecular structure, Phase transformations, Cryogenics

## 53-4870

**Physical chemistry of ices in the outer solar system.** Kargel, J.S., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.3-32, 53 refs.  
DLC QB462.6.S654 1998  
Satellites (natural), Planetary environments, Extraterrestrial ice, Clathrates, Hydrates, Frozen liquids, Ice composition, Ice vapor interface, Ice sublimation, Molecular structure, Cryogenics, Geologic processes

## 53-4871

**Thermal conductivity of solar system ices, with special reference to Martian polar caps.** Ross, R.G., Kargel, J.S., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.33-62, 65 refs.  
DLC QB462.6.S654 1998  
Planetary environments, Satellites (natural), Mars (planet), Extraterrestrial ice, Ice composition, Ice thermal properties, Thermal conductivity, Heat transfer, Phase transformations, Clathrates, Hydrates, Molecular structure

## 53-4872

**Rheology of planetary ices.** Durham, W.B., Kirby, S.H., Stern, L.A., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.63-78, 34 refs.  
DLC QB462.6.S654 1998  
Satellites (natural), Planetary environments, Extraterrestrial ice, High pressure ice, Clathrates, Hydrates, Ice composition, Ice strength, Ice creep, Ice deformation, Rheology, Cryogenics

## 53-4873

**Thermodynamic properties of high pressure ices: implications for the dynamics and internal structure of large icy satellites.** Sotin, C., Grasset, O., Beauchesne, S., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.79-96, 45 refs.  
DLC QB462.6.S654 1998  
Satellites (natural), Planetary environments, Extraterrestrial ice, Clathrates, Hydrates, Frozen liquids, High pressure ice, Ice composition, Ice thermal properties, Cryogenics, Phase transformations

## 53-4874

**Clathrate hydrates on Earth and in the solar system.** Kargel, J.S., Lunine, J.I., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.97-117, 66 refs.  
DLC QB462.6.S654 1998  
Clathrates, Hydrates, Permafrost, Frozen ground chemistry, Mars (planet), Extraterrestrial ice, Ice composition, Molecular structure

## 53-4875

**Metamorphism of solar system ices.** Eluszkiewicz, J., Leliwa-Kopystyński, J., Kossacki, K.J., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.119-138, 56 refs.  
DLC QB462.6.S654 1998  
Satellites (natural), Planetary environments, Extraterrestrial ice, Ice structure, Ice density, Ice sintering, Ice pressure, Ice creep, Ice deformation, Mathematical models

## 53-4876

**Amorphous water ice: a solar system material.** Jenniskens, P., Blake, D.F., Kouchi, A., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.139-155, 74 refs.  
DLC QB462.6.S654 1998  
Amorphous ice, Extraterrestrial ice, Ice sublimation, Ice thermal properties, Ice composition, Water structure, Molecular structure, Clathrates, Hydrates, Phase transformations

53-4877

**Reflectance spectroscopy of icy surfaces.**

Verbiscer, A., Helfenstein, P., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.157-197, Refs. p.192-197.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice structure, Ice density, Ice spectroscopy, Ice optics, Ice detection, Photometry, Mathematical models

53-4878

**Optical properties of ices from UV to infrared.**

Schmitt, B., Quirico, E., Trotta, F., Grundy, W.M., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.199-240, Refs. p.235-240.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Extraterrestrial ice, Ice optics, Ice spectroscopy, Ice composition, Ice structure, Ice thermal properties, Ice detection, Phase transformations, Molecular structure

53-4879

**Microwave properties of ice and snow.**

Mätzler, C., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.241-257, 37 refs.

DLC QB462.6.S654 1998

Snow electrical properties, Ice electrical properties, Ice dielectrics, Ice structure, Ice detection, Microwaves, Backscattering, Radar echoes, Radiometry, Mathematical models

53-4880

**UV photochemistry of ices: the role of photons in the processing of ices.**

Salama, F., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.259-279, 70 refs.

DLC QB462.6.S654 1998

Planetary environments, Cosmic dust, Satellites (natural), Extraterrestrial ice, Ice optics, Ice structure, Ice composition, Ultraviolet radiation, Solar radiation, Radiation absorption, Photochemical reactions, Ionization, Molecular structure, Molecular energy levels

53-4881

**Chemistry of ice induced by bombardment with energetic charged particles.**

Strazzulla, G., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.281-301, 63 refs.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Cosmic dust, Extraterrestrial ice, Ice composition, Ice sublimation, Ice spectroscopy, Solar radiation, Radiation absorption, Ionization, Molecular structure, Molecular energy levels, Cryogenics

53-4882

**Sputtering and desorption from icy surfaces.**

Johnson, R.E., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.303-334, Refs. p.327-334.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Extraterrestrial ice, Ice composition, Ice spectroscopy, Ice sublimation, Solar radiation, Ionization, Molecular structure, Molecular energy levels, Cryogenics, Mathematical models

53-4883

**From interstellar dust to comets: distributed CO in comet Halley.**

Greenberg, J.M., Li, A.G., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.337-351, 39 refs.

DLC QB462.6.S654 1998

Cosmic dust, Planetary environments, Extraterrestrial ice, Ice sublimation, Ice composition, Ice spectroscopy, Molecular structure

53-4884

**Trapping of gases in water ice and consequences to comets and the atmospheres of the inner planets.**

Bar-Nun, A., Owen, T.C., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.353-366, 45 refs.

DLC QB462.6.S654 1998

Planetary environments, Extraterrestrial ice, Amorphous ice, Ice composition, Ice sublimation, Gas inclusions, Atmospheric composition, Molecular structure

53-4885

**Origin and evolution of comets, icy planets and satellites.**

Forni, O., Federico, C., Coradini, A., Magni, G., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.367-394, Refs. p.388-394.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Extraterrestrial ice, Ice composition, Ice sublimation, Phase transformations

53-4886

**Composition and physical properties of comets.**

Rickman, H., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.395-417, Refs. p.412-417.

DLC QB462.6.S654 1998

Planetary environments, Cosmic dust, Extraterrestrial ice, Ice composition, Ice structure, Ice sublimation, Phase transformations

53-4887

**Terrestrial snow studies from remote sensing in the solar spectrum and the thermal infrared.**

Fily, M., Leroux, C., Lenoble, J., Sergeant, C., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.421-441, 80 refs.

DLC QB462.6.S654 1998

Snow surveys, Snow cover distribution, Snow surface temperature, Snow cover structure, Snow morphology, Snow optics, Albedo, Reflectivity, Radiometry, Spaceborne photography

53-4888

**Polar stratospheric clouds on Earth: a review of particle thermodynamics, nucleation and growth kinetics.**

Peter, T., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.443-475, 74 refs.

DLC QB462.6.S654 1998

Polar atmospheres, Atmospheric composition, Atmospheric circulation, Polar stratospheric clouds, Cloud physics, Cloud droplets, Aerosols, Ice nuclei, Ozone

53-4889

**Mars CO<sub>2</sub> ice polar caps.**

Forget, F., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.477-507, 85 refs.

DLC QB462.6.S654 1998

Mars (planet), Planetary environments, Atmospheric circulation, Atmospheric composition, Carbon dioxide, Ice sublimation, Hoarfrost, Extraterrestrial ice, Ice composition, Radiometry, Spaceborne photography

53-4890

**Introduction to icy satellite geology.**

Johnson, T.V., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.511-523, 29 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Geologic processes, Geomorphology, Tectonics, Spaceborne photography

53-4891

**Geodynamics of icy satellites.**

McKinnon, W.B., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.525-550, 60 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice thermal properties, Convection, Phase transformations, Thermodynamics, Rheology, Tectonics, Geologic processes, Geomorphology, Mathematical models

53-4892

**Geologic landforms and processes on icy satellites.**

Schenk, P.M., Moore, J.M., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.551-578, Refs. p.574-578.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice thermal properties, Volcanoes, Geologic processes, Rheology, Tectonics, Geomorphology

53-4893

**Ices on the satellites of Jupiter, Saturn, and Uranus.**

Cruikshank, D.P., Brown, R.H., Calvin, W.M., Roush, T.L., Bartholomew, M.J., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.579-606, 76 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice spectroscopy, Ice detection

53-4894

**Ices on Io—composition and texture.**

Nash, D.B., Betts, B.H., *Astrophysics and Space Science Library*, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.607-637, 87 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice spectroscopy, Ice sublimation, Ice detection, Hoarfrost, Molecular structure

## 53-4895

**Surface-atmosphere interactions on Titan.**

Lunine, J.I., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.639-653, 40 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Atmospheric composition, Ice nuclei, Extraterrestrial ice, Ice composition, Ice sublimation, Liquefied gases, Molecular structure, Photochemical reactions

## 53-4896

**Surface compositions of Triton, Pluto, and Charon.**

Cruikshank, D.P., Roush, T.L., Owen, T.C., Quirico, E., De Bergh, C., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.655-684, 91 refs.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Extraterrestrial ice, Ice composition, Ice sublimation, Ice spectroscopy, Molecular structure, Cryogenics, Mathematical models

## 53-4897

**Pluto and the Kuiper Disk.**

Stern, S.A., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.685-709, 81 refs.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Extraterrestrial ice, Ice composition, Ice sublimation, Ice spectroscopy, Molecular structure, Cryogenics

## 53-4898

**Rings of the outer planets.**

Dones, L., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.711-734, Refs. p.727-734.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Cosmic dust, Extraterrestrial ice, Ice composition, Ice sublimation

## 53-4899

**Ices in the giant planets.**

Podolak, M., Hubbard, W.B., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.735-748, 30 refs.

DLC QB462.6.S654 1998

Planetary environments, Extraterrestrial ice, Ice composition, Ice sublimation, High pressure ice, Molecular structure, Phase transformations, Cryogenics, Mathematical models

## 53-4900

**Atmospheric ices.**

Samuelson, R.E., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.749-772, 57 refs.

DLC QB462.6.S654 1998

Planetary environments, Satellites (natural), Atmospheric composition, Cloud physics, Ice nuclei, Extraterrestrial ice, Ice composition, Ice spectroscopy, Ice sublimation, Photochemical reactions, Molecular structure

## 53-4901

**Surface/atmosphere interactions and volatile transport (Triton, Pluto, and Io).**

Trafton, L.M., Matson, D.L., Stansberry, J.A., Astrophysics and Space Science Library, Vol.227. Solar system ices. Edited by B. Schmitt, C. de Bergh, and M. Festou, Dordrecht, Netherlands, Kluwer Academic Publishers, 1998, p.773-812, Refs. 807-812.

DLC QB462.6.S654 1998

Satellites (natural), Planetary environments, Atmospheric composition, Extraterrestrial ice, Ice composition, Ice sublimation, Hoarfrost, Photochemical reactions, Molecular structure, Phase transformations, Cryogenics

## 53-4902

**Estimation of usability of aggregate for frost resistant concretes. [Ocena przydatności kruszywa do betonów mrozoodpornych]**

Rusin, Z., *Archiwum inżynierii lądowej*, 1988, 34(1), p.123-139, In Polish with Russian and English summaries. 9 refs.

DLC TA4.A7 Vol.34 1988

Concretes, Concrete strength, Frost resistance, Concrete aggregates

## 53-4903

**Mid-Holocene climate in Europe: what can we infer from PMIP model-data comparisons?**

Masson, V., Cheddadi, R., Braconnot, P., Joussaume, S., Texier, D., *Climate dynamics*, Mar. 1999, 15(3), p.163-182, 66 refs.

Paleobotany, Palynology, Phenology, Atmospheric circulation, Air temperature, Surface temperature, Precipitation (meteorology), Degree days, Global change, Paleoclimatology, Computerized simulation

## 53-4904

**Impact of new land surface physics on the GCM simulation of climate and climate sensitivity.**

Cox, P.M., Betts, R.A., Bunton, C.B., Essery, R.L.H., Rowntree, P.R., Smith, J., *Climate dynamics*, Mar. 1999, 15(3), p.183-203, 40 refs.

Soil air interface, Snow heat flux, Snow cover effect, Radiation balance, Evapotranspiration, Atmospheric circulation, Vegetation factors, Nutrient cycle, Geochemical cycles, Carbon dioxide, Global warming, Computerized simulation, Mathematical models

## 53-4905

**Last Glacial Maximum climate of the former Soviet Union and Mongolia reconstructed from pollen and plant macrofossil data.**

Tarasov, P.E., et al, *Climate dynamics*, Mar. 1999, 15(3), p.227-240, Refs. p.238-240.

Paleobotany, Palynology, Vegetation patterns, Fossils, Global change, Paleoclimatology, Statistical analysis, Computerized simulation, Russia, Mongolia

## 53-4906

**Icy flood of 1985 on the Upper-Tisza section. [Az 1985. évi felső-tiszaí jeges árvíz]**

Illés, L., *Vízügyi közlemények*, 1986, 68(4), p.549-558, In Hungarian with Russian, English and German summaries.

DLC GB726.H8 V52 1986 No.4

Rivers, River ice, Floods, Ice jams, Flood forecasting, Snow water equivalent, Temperature effects, Hungary

## 53-4907

**Estimate of some rheological properties of asphalt concretes under cyclic loading conditions. [Ocena wybranych reologicznych właściwości betonów asfaltowych w warunkach obciążenia cyklicznego]**

Kalabińska, M., Piłt, J., Dietrich, L., *Archiwum inżynierii lądowej*, 1989, 35(1), p.95-106, In Polish with Russian and English summaries. 5 refs.

DLC TA4.A7 Vols.35-36 1989-90

Bituminous concretes, Rheology, Loads (forces), Isotherms, Low temperature tests, Viscoelasticity

## 53-4908

**Numerical model for computing the soil freezing depth. [Model numeryczny obliczania głębokości zamarzania gruntu]**

Ickiewicz, I., Panek, A., *Archiwum inżynierii lądowej*, 1990, 36(1-2), p.157-166, In Polish with Russian and English summaries. 4 refs.

DLC TA4.A7 Vols.35-36 1989-90

Mathematical models, Frost penetration, Soil freezing, Enthalpy, Stefan problem, Thermal conductivity

## 53-4909

**Mixing of meltwater and groundwater in a forested basin.**

Bengtsson, L., Lepistö, A., Saxena, R.K., Seuna, P., *Aqua fennica*, 1991, 21(pt.1), p.3-12, With Finnish summary. 12 refs.

DLC GB727.4.A65 Vol.21 Pt.1 1991

Meltwater, Snowmelt, Ground water, Oxygen isotopes, Runoff, River basins, Forest land, Finland

## 53-4910

**Aluminium from two glacial tills: flows and retention mechanisms.**

Ågren, S., Jacks, G., *Aqua fennica*, 1991, 21(pt.1), p.29-37, 42 refs.

DLC GB727.4.A65 Vol.21 Pt.1 1991

Glacial till, Soil profiles, Soil water, Ions, Podsol, Water chemistry, Sweden

## 53-4911

**Detection and measurement of ice thickness using microprocessor-controlled resonant transducers.**

Roy, S., Izad, A., DeAnna, R., Mehregany, M., *SPIE—The International Society for Optical Engineering. Proceedings*, 1998, Vol.3329, Smart structures and materials 1998: Smart structures and integrated systems, Pt.1. Edited by M.E. Regellbrugge, p.10-20, 9 refs.

DLC TA418.9.S62 S52989 1998

Aircraft icing, Ice accretion, Ice electrical properties, Ice detection, Ice formation indicators, Thickness gages

## 53-4912

**Palynostratigraphy of Eemian interglacial and Early Vistulian in the South Great Polish Lowland (Wielkopolska) and Lower Silesia. [Palynostratygrafia osadów interglacjalnych eemskiego i wczesnego wistulianu w południowej Wielkopolsce i na Dolnym Śląsku]**

Kuszell, T., *Wrocław. Uniwersytet. Acta Universitatis Wratislaviensis. Prace geologiczno-mineralogiczne LX*, 1997, No.1965, 70p. + plates, In Polish with extended English summary. Refs. p.59-65.

DLC QE1.B64 No.60

Paleobotany, Paleoclimatology, Palynology, Vegetation patterns, Pollen, Lacustrine deposits, Poland

## 53-4913

**Snow and ice chemistry study of the Greenland ice sheet.**

Yang, Q.Z., Durham, University of New Hampshire, 1996, 145p., University Microfilms order No.DA96-27171, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(4), p.2425.

Atmospheric composition, Scavenging, Snow air interface, Snow composition, Snow accumulation, Snow ice interface, Ice sheets, Glacier ice, Ice composition, Snow samplers, Ice cores, Paleoclimatology, Greenland

## 53-4914

**Recharge to discharge groundwater travel times in the Michigan basin and the effect of glacial ice loading.**

Hoaglund, J.R., III, East Lansing, Michigan State University, 1996, 274p., University Microfilms order No.DA97-06494, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(9), p.5541.

Glaciation, Glacial geology, Ice sheets, Glacial hydrology, Meltwater, Subglacial drainage, Ground water, Glacial lakes, Isotopic labeling, Paleoclimatology, United States—Michigan, Lake

53-4915

**Scale effects on the fracture of ice.**

Adamson, R.M., Potsdam, NY, Clarkson University, 1996, 114p., University Microfilms order No.DA97-07366, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(10), p.6415.

Sea ice, Ice cover strength, Ice elasticity, Ice creep, Ice deformation, Ice loads, Ice pressure, Ice cracks, Ice breaking, Stress concentration

53-4916

**Boundary detection using multisensor imagery: application to ice sheet margin detection.**

Sohn, H.G., Columbus, Ohio State University, 1996, 184p., University Microfilms order No.DA97-10660, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(10), p.6136.

Glacier surveys, Ice sheets, Glacier oscillation, Glacier flow, Topographic surveys, Geodetic surveys, Synthetic aperture radar, Mapping, Spaceborne photography, Image processing

53-4917

**Infiltration into frozen soils. [Przebieg procesu infiltracji w gruntach zamrażniętych]**

Soczyńska, U., Sieklucki, L., *Przegląd geofizyczny*, 1988, 33(1), p.21-31, In Polish with English summary. 16 refs.

DLC QC851.P72 V.33 1988

Mathematical models, Permeability, Loams, Frozen ground mechanics, Freeze thaw cycles, Soil freezing, Ground thawing, Frozen ground thermodynamics, Thermal conductivity, Hydraulics, Heat capacity

53-4918

Symptoms of discontinuous tectonics in Quaternary formations of the right bank of the Vistula valley between Płock and Włocławek. [Przejawy tektoniki nieciągłej w utworach czwartorzędowych prawego zbocza doliny Wisły między Płockiem a Włocławkiem]

Korotaj-Kokoszczynska, M., Mizerski, W., *Przegląd geofizyczny*, 1988, 33(1), p.53-63, In Polish with English summary. 14 refs.

DLC QC851.P72 V.33 1988

Tectonics, Quaternary deposits, Glacial geology, Glacial erosion, Poland—Płock, Poland—Włocławek

53-4919

Perspectives of development of hydrological sciences (in the light of results of work of the IAHS "Hydrology 2000" Working Group). [Perspektywy rozwoju nauk hydrologicznych (w świetle wyników pracy grupy roboczej IAHS "Hydrologia 2000")]

Kundzewicz, Z., *Przegląd geofizyczny*, 1988, 33(3), p.227-237, In Polish with English summary.

DLC QC851.P72 V.33 1988

Hydrology, Mathematical models, Surface waters, Ground water, Sedimentation, Snow hydrology, Ice cover effect, Snow cover effect, Snow air interface, Air ice water interaction, Climatic changes, Erosion

53-4920

**Scale effects on the in-situ tensile strength and fracture of ice. Part I: Large grained freshwater ice at Spray Lakes Reservoir, Alberta.**

Dempsey, J.P., DeFranco, S.J., Adamson, R.M., Mulmule, S.V., Fracture scaling. Edited by Z.P. Bazant and Y.D.S. Rajapakse, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.325-345, 48 refs. Reprinted from International journal of fracture, Vol.95, 1999.

DLC TA409.F7195 1999

Lake ice, Ice structure, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice cracks, Ice breaking, Stress concentration, Canada—Alberta—Spray Lakes Reservoir

53-4921

**Scale effects on the in-situ tensile strength and fracture of ice. Part II: First-year sea ice at Resolute, N.W.T.**

Dempsey, J.P., Adamson, R.M., Mulmule, S.V., Fracture scaling. Edited by Z.P. Bazant and Y.D.S. Rajapakse, Dordrecht, Netherlands, Kluwer Academic Publishers, 1999, p.347-366, Refs. p.363-366. Reprinted from International journal of fracture, Vol.95, 1999.

DLC TA409.F7195 1999

Sea ice, Ice structure, Ice cover strength, Ice loads, Ice pressure, Ice deformation, Ice cracks, Ice breaking, Stress concentration, Canada—Northwest Territories—Resolute

53-4922

**Transport, preservation and accumulation of organic carbon in the North Sea. [Transport, preservatie en accumulatie van organische koolstof in de Noordzee]**

De Haas, H., ed, *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, 149p., With Dutch summary. Refs. passim. For individual papers see 53-4923 through 53-4927.

DLC QE1.G1342 No.155

Sedimentation, Sediment transport, Grain size, Organic nuclei, Paleoclimatology, Greenhouse effect, Marine deposits, Bottom sediment, North Sea

53-4923

**Recent sediment accumulation in the Norwegian Channel, North Sea.**

De Haas, H., Okkels, E., Van Weering, T.C.E., *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, Transport, preservation and accumulation of organic carbon in the North Sea. Edited by H. de Haas, p.23-39, 36 refs.

DLC QE1.G1342 No.155

Sedimentation, Sediment transport, Grain size, Glacial erosion, Ocean currents, Radioactive isotopes, Marine deposits, Glacial deposits, North Sea

53-4924

**Recent sediment accumulation, organic carbon burial and transport in the northeastern North Sea.**

De Haas, H., Van Weering, T.C.E., *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, Transport, preservation and accumulation of organic carbon in the North Sea. Edited by H. de Haas, p.41-62, Refs. p.58-62.

DLC QE1.G1342 No.155

Sedimentation, Sediment transport, Hydrography, Grain size, Ocean currents, Wind factors, Bottom sediment, Suspended sediments, Organic nuclei, North Sea

53-4925

**Recent sedimentation and organic carbon burial in a shelf sea; the North Sea.**

De Haas, H., Boer, W., Van Weering, T.C.E., *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, Transport, preservation and accumulation of organic carbon in the North Sea. Edited by H. de Haas, p.63-83, Refs. p.79-83.

DLC QE1.G1342 No.155

Sedimentation, Organic nuclei, Sediment transport, Radioactive isotopes, Marine deposits, North Sea

53-4926

**Organic carbon preservation in the Skagerrak and Norwegian Channel (North Sea); a case of grain size and type of organic matter.**

De Haas, H., *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, Transport, preservation and accumulation of organic carbon in the North Sea. Edited by H. de Haas, p.85-107, Refs. p.104-107.

DLC QE1.G1342 No.155

Grain size, Sedimentation, Sediment transport, Drill core analysis, Radioactive isotopes, Bottom sediment, North Sea

53-4927

**Preservation of organic carbon in the North Sea compared to other shelf seas: a synthesis on processes and products.**

De Haas, H., *Utrecht. Universiteit. Faculteit Aardwetenschappen. Geologica Ultraiectina*, 1997, No.155, Transport, preservation and accumulation of organic carbon in the North Sea. Edited by H. de Haas, p.109-146, Refs. p.137-146.

DLC QE1.G1342 No.155

Grain size, Sedimentation, Hydrology, Paleoclimatology, Glacial deposits, Bottom sediment, Sediment transport, Greenhouse effect, Marine deposits, North Sea

53-4928

**Late glacial and Holocene lacustrine sediments of the lake Czarny Staw Gąsienicowy in the Tatra Mountains. [Późnoglacialne i holocenijskie osady z Czarnego Stawu Gąsienicowego w Tatrach]**

Baumgart-Kotarba, M., Kotarba, A., *Polska Akademia Nauk. Instytut Geografii i Przestrzennego Zagospodarowania. Dokumentacja geograficzna*, 1993, No.4-5, Z badań fizyczno-geograficznych w Tatrach (Physical geography study in the Tatra Mountains). Edited by A. Kotarba, p.9-30, In Polish with English summary. 18 refs.

DLC G23.D63 1993 Zesz.4-5

Lacustrine deposits, Sediments, Pleistocene, Grain size, Glacial deposits, Palynology, Poland—Tatra Mountains

53-4929

**Fluctuation of the forest limit in the Tatra Mountains during the last 12 000 years. [Wahania górnej granicy lasu w późnym plejstocenie i holocenie w Tatrach]**

Obidowicz, A., *Polska Akademia Nauk. Instytut Geografii i Przestrzennego Zagospodarowania. Dokumentacja geograficzna*, 1993, No.4-5, Z badań fizyczno-geograficznych w Tatrach (Physical geography study in the Tatra Mountains). Edited by A. Kotarba, p.31-43 + 3 fold. tables, In Polish with English summary. 22 refs.

DLC G23.D63 1993 Zesz.4-5

Pollen, Palynology, Forest lines, Paleoclimatology, Trees (plants), Lacustrine deposits, Spectra, Poland—Tatra Mountains

53-4930

**Young Holocene lacustrine sediments from Lake Morskie Oko in the High Tatra Mountains and their dating by use of <sup>210</sup>Pb and <sup>14</sup>C. [Młode holocenijskie osady jeziorne Morskiego Oka w Tatrach Wysokich oraz ich datowanie radioizotopami <sup>210</sup>Pb i <sup>14</sup>C]**

Baumgart-Kotarba, M., Kotarba, A., Wachniew, P., *Polska Akademia Nauk. Instytut Geografii i Przestrzennego Zagospodarowania. Dokumentacja geograficzna*, 1993, No.4-5, Z badań fizyczno-geograficznych w Tatrach (Physical geography study in the Tatra Mountains). Edited by A. Kotarba, p.45-61 + 2 fold. tables, In Polish with English summary. 18 refs.

DLC G23.D63 1993 Zesz.4-5

Lacustrine deposits, Radioactive isotopes, Geomorphology, Grain size, Quaternary deposits, Poland—Tatra Mountains

53-4931

**Quantitative rates of nivation in the High Tatra Mountains. [Ilościowe wskaźniki niwacji w Tatrach Wysokich]**

Rączkowska, Z., *Polska Akademia Nauk. Instytut Geografii i Przestrzennego Zagospodarowania. Dokumentacja geograficzna*, 1993, No.4-5, Z badań fizyczno-geograficznych w Tatrach (Physical geography study in the Tatra Mountains). Edited by A. Kotarba, p.63-81, In Polish with English summary. 14 refs.

DLC G23.D63 1993 Zesz.4-5

Nivation, Meltwater, Runoff, Microclimatology, Weathering, Poland—Tatra Mountains



## 53-4932

**Coastal ocean prediction.**  
Moore, C.N.K., ed. Coastal and Estuarine Studies, Vol. 56, Washington, D.C., American Geophysical Union, 1999, 523p., Refs. passim. For selected papers see 53-4933 through 53-4938.  
DLC GB451.2.C57 1999

Marine atmospheres, Marine meteorology, Ocean currents, Tides, Water temperature, Air ice water interaction, Sea ice distribution, Ice conditions, Ice models, Ice forecasting, Weather forecasting

## 53-4933

**Introduction to coastal ocean prediction.**  
Moore, C.N.K., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.1-5, 8 refs.  
DLC GB451.2.C57 1999

Ocean environments, Ocean currents, Tides, Marine atmospheres, Regional planning, Environmental protection

## 53-4934

**Coastal meteorology.**  
Overland, J.E., Friehe, C., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.7-29, Refs. p.26-29.  
DLC GB451.2.C57 1999

Marine meteorology, Air water interactions, Snowstorms, Weather forecasting

## 53-4935

**Overview of coastal ocean models.**  
Greatbatch, R.J., Mellor, G.L., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.31-57, Refs. p.52-57.  
DLC GB451.2.C57 1999

Ocean currents, Water temperature, Salinity, Water transport, Air ice water interaction, Ice models, Computer programs

## 53-4936

**Temperature simulation in the NW European shelf seas.**  
Elliott, A.J., Li, Z.H., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.175-193, 27 refs.  
DLC GB451.2.C57 1999

Marine atmospheres, Atmospheric circulation, Air water interactions, Ocean currents, Tides, Surface temperature, Water temperature, Mathematical models, Computerized simulation, North Sea

## 53-4937

**Prediction in ice-covered shallow seas.**  
Preller, R.H., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.405-441, Refs. p.437-441.  
DLC GB451.2.C57 1999

Air ice water interaction, Sea ice distribution, Ice conditions, Ice cover thickness, Ice heat flux, Ice cover effect, Drift, Ice forecasting, Ice models, Mathematical models, Computer programs

## 53-4938

**Norwegian perspective.**  
Guddal, J., Coastal ocean prediction. Edited by C.N.K. Moore, Washington, D.C., American Geophysical Union, 1999, p.513-519, 3 refs.  
DLC GB451.2.C57 1999

Marine meteorology, Sea ice distribution, Ice conditions, Ice forecasting, Ice reporting, Weather forecasting, Data transmission, Norway

## 53-4939

**Assessment of snow cover effects on the dynamics of cryogenic rocks freezing. [K otsenke viliannia snezhnogo pokrova na dinamiku promerzaniia kriegennykh porod]**  
Osokin, N.I., Samoilov, R.S., Sosnovskii, A.V., Zhidkov, V.A., Balaeva, V.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.3-11, In Russian with English summary. 40 refs.  
DLC QE575.A43

Snow cover effect, Frozen rocks, Mathematical models, Soil freezing, Frost penetration, Snow depth, Snow thermal properties, Thermal conductivity

## 53-4940

**Effects of temperature changes near the foot of Late Pleistocene ice sheet on formation of glacial-tectonic structure (western coast of the Yamal Peninsula). [Vliianie izmenenii temperaturnykh uslovii u podoshvy pozdnepleistotsenovogo lednikovogo pokrova na formirovanie gliatsiologicheskikh struktur (zapadnoe poberezh'e p-ova Iamal)]**  
Kaplianskaia, F.A., Tarnogradskii, V.D., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.12-17, In Russian with English summary. 27 refs.  
DLC QE575.A43

Ice veins, Ice wedges, Temperature effects, Pleistocene, Cryogenic structures, Tectonics, Glacial geology, Periglacial processes, Deformation, Russia—Yamal Peninsula

## 53-4941

**Intensive snowfalls in the Elbrus area for the period of instrumental observations of 1951-1995. [Intensivnye snegopady v Priel'brus'e za period instrumental'nykh nabludenii 1951-1995 gg.]**  
Olekhov, A.D., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.18-24, In Russian with English summary. 7 refs.  
DLC QE575.A43

Snowfall, Snow depth, Air temperature, Forecasting, Avalanches, Snow air interface, Snowstorms, Avalanche forecasting, Georgia—Elbrus

## 53-4942

**Structure and chemical composition in the active layer of the Bolshoy Azau Glacier, Elbrus, in its accumulation area. [Stroenie i khimicheskii sostav delatel'nogo sloia lednika Bol'shoi Azau (El'brus) v oblasti pitaniia]**  
Rototava, O.V., Khmelevskoi, I.F., Bazhev, A.B., Heintzenberg, J., Stenberg, M., Pinglot, J.F., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.25-33, In Russian with English summary. 19 refs.  
DLC QE575.A43

Active layer, Ice cores, Drill core analysis, Glacier ice, Ice composition, Ions, Ice water interface, Ice air interface, Firn stratification, Glacier alimentation, Glacial hydrology, Georgia—Elbrus, Georgia—Bolshoy Azau Glacier

## 53-4943

**Specific feature of intra-annual distribution of the Altai rivers runoff. [Osobennosti vnutrigodovogo raspredeleniia stoka rek Altaia]**  
Narozhnyi, I.U.K., Paromov, V.V., Shantykova, L.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.34-40, In Russian with English summary. 10 refs.  
DLC QE575.A43

Rivers, Runoff, Seasonal variations, Glacial rivers, Russia—Ob' River

## 53-4944

**Expectations and realities of space glaciology. [Nadezhdy i real'nosti kosmicheskoi gliatsiologii]**  
Knizhnikov, I.U.F., Kravtsova, V.I., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.41-47, In Russian with English summary. 31 refs.  
DLC QE575.A43

Glaciology, Remote sensing, Electromagnetic prospecting, Sea ice, Snow cover, Spacecraft, Ice cover, Ice surveys, Snow surveys, Glacier surveys

## 53-4945

**Stereoscopic modelling of glacier surface displacement by photographs taken at different time. [Stereoskopicheskoe modelirovanie peremeshcheniia poverkhnosti lednikov po razno vremennym aerofotostimkam]**  
Zolotarev, E.A., Khar'kovets, E.G., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.48-51, In Russian with English summary. 8 refs.  
DLC QE575.A43

Glacier surfaces, Glacier flow, Photogrammetry, Photointerpretation, Aerial surveys, Georgia—Elbrus

## 53-4946

**Present degradation of glaciation on the northern slope of the Zailiyskiy Alatau. [Sovremennaya degradatsiia oledeneniia severnogo sklona Zailiiskogo Alatau]**  
Vilesov, E.N., Uvarov, V.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.52-59, In Russian with English summary. 14 refs.  
DLC QE575.A43

Glacier melting, Glacier ablation, Degradation, Glacier mass balance, Glacier surveys, Kazakhstan—Zailiyskiy Alatau

## 53-4947

**Some questions of the glacial ice penetrability. [Nekotorye voprosy pronitsaemosti lednikovogo l'da dlia vody]**  
Mavliudov, B.R., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.60-65, In Russian with English summary. 18 refs.  
DLC QE575.A43

Ice water interface, Glacier ice, Permeability, Ice temperature, Ice tunnels, Velocity, Glacial hydrology

## 53-4948

**Specific features of chemical composition formation of the Kabardino-Balkarian glaciers. [Osobennosti formirovaniia khimicheskogo sostava lednikov Kabardino-Balkarii]**  
Kerimov, A.M., Rototava, O.V., Khmelevskoi, I.F., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.66-71, In Russian with English summary. 9 refs.  
DLC QE575.A43

Glacier ice, Ice composition, Ions, Impurities, Ice air interface, Aerosols, Precipitation (meteorology), Glacier surveys, Snow composition, Firn, Russia—Kabardino-Balkar

## 53-4949

**Automated working place of an avalanche forecaster. [Avtomatizirovannoe rabochee mesto prognostizatsii snezhnykh lavin]**  
Chernous, P.A., Perlikov, A.M., Mokrov, E.G., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.72-75, In Russian with English summary. 6 refs.  
DLC QE575.A43

Avalanche forecasting, Computers, Computer programs, Snow cover

## 53-4950

**Mathematical and physical modelling of snow-dust avalanches. [Matematicheskoe i fizicheskoe modelirovanie snezhno-pylevykh lavin]**  
Eglit, M.E., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.76-79, In Russian with English summary. 40 refs.  
DLC QE575.A43

Avalanche mechanics, Avalanche modeling, Mathematical models

## 53-4951

**Experimental study of the operation of avalanche-directing and avalanche-detonating systems. [Eksperimental'nye issledovaniia raboty lavinonapravialushchikh i lavinozaderzhivalushchikh sistem]**  
Iadrosnikov, V.I., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.80-87, In Russian with English summary. 17 refs.  
DLC QE575.A43

Avalanche protection, Countermeasures, Analysis (mathematics), Design, Snow cover effect, Avalanche engineering, Snow loads

53-4952

Effects of global climate change on the avalanche regime on the territory of the former Soviet Union. [Vliianie global'nogo izmeneniia klimata na lavinnyi rezhim na territorii byvshego Sovetskogo Soiuza]

Glazovskaia, T.G., Troshkina, E.S., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.88-91, In Russian with English summary. 2 refs.

DLC QE575.A43

Global change, Climatic changes, Avalanche forecasting, Snow depth, Snowfall, Air temperature, CIS

53-4953

Water-snow flows on the Putorana Plateau. [Vodosnezhnye potoki na plato Putorana]

Voitkovskii, K.F., Korol'kov, V.G., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.92-94, In Russian with English summary. 1 ref.

DLC QE575.A43

Mudflows, Meltwater, Water flow, Snowmelt, Countermeasures, Design, Russia—Siberia

53-4954

Snow patches of West Caucasus. [Snezhniki Zapadnogo Kavkaza]

Glushkova, I.A., Panova, S.V., Efremov, I.U.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.95-99, In Russian with English summary. 14 refs.

DLC QE575.A43

Snowdrifts, Nivation, Avalanches, Snowmelt, Air temperature, River flow, Classifications, Caucasus Mountains

53-4955

Specific features of the thermal winter regime in the Greater Caucasus. [Osobennosti termicheskogo rezhima zimnego perioda na Bol'shom Kavkaze]

Pogorelov, A.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.100-107, In Russian with English summary. 13 refs.

DLC QE575.A43

Thermal regime, Air temperature, Snow cover, Statistical analysis, Snow air interface, Caucasus Mountains

53-4956

Possibilities of estimation of the mudflow activity in connection with global climate change. [Vozmozhnosti otsenki izmeneniia kharaktera selevoï delatel'nosti v sviazi s global'nym izmeneniiem klimata]

Sidorova, T.L., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.108-113, In Russian with English summary. 16 refs.

DLC QE575.A43

Mudflows, Climatic changes, Global change, Snowfall, Rain

53-4957

Fluctuations of activity and prediction of glacial mudflows in the Central Caucasus in the XX-th century. [Izmenenie aktivnosti i prognoz gliatsial'nykh seleï Tsentral'nogo Kavkaza v XX stoletii]

Seinova, I.B., Mal'neva, I.V., Kononova, N.K., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.114-120, In Russian with English summary. 9 refs.

DLC QE575.A43

Mudflows, Air temperature, Precipitation (meteorology), Glacier melting, Long range forecasting, Snowfall, Caucasus Mountains, Russia—Baksan River

53-4958

Paleohydrology of Eurasia during the last glaciation. [Paleogidrologia Evrazii v epokhu poslednego oledeneniia]

Grosval'd, M.G., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.121-129, In Russian with English summary. 42 refs.

DLC QE575.A43

Paleoclimatology, Hydrology, Ice dams, Hydrography, Spillways, Water flow, Drainage, Glaciation

53-4959

Use of modern glacio-climatic relationship for reconstruction of past glaciation (by the example of Scandinavian glaciation during the Middle Valdaia). [Isopol'zovanie sovremennykh gliatsioklimaticheskikh sviazei dlia rekonstruktsii drevnego oledeneniia (na primere oledeneniia Skandinavii v period Srednego Valdaia)]

Kononov, I.U.M., Ananicheva, M.D., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.130-135, In Russian with English summary. 14 refs.

DLC QE575.A43

Paleoclimatology, Glaciation, Pleistocene, Ice age theory

53-4960

Regularities of changes of snow elastic properties at its consolidation and diagnoses. [Zakonomernosti izmeneniia uprugikh svoïstv snega pri ego uplotnenii i diageneze]

Frolov, A.D., Fediukin, I.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.136-140, In Russian with English summary. 16 refs.

DLC QE575.A43

Snow elasticity, Diagenesis, Snow acoustics, Snow ice interface, Porosity, Analysis (mathematics), Snow strength

53-4961

Problems of interaction of nival-glacial phenomena and human activity. [Problemy vzaimodeïstviia nival'no-gliatsial'nykh iavlenii i deiatel'nosti cheloveka]

Osokin, N.I., Samoilov, R.S., Sosnovskii, A.V., Zhidkov, V.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.141-147, In Russian with English summary. 7 refs.

DLC QE575.A43

Nivation, Glaciation, Classifications, Environmental impact, Damage, Human factors, Regional planning, Safety

53-4962

On the water content in subpolar and temperate glaciers according to the data of measurements of radio-wave velocities. [Otsenka soderzhaniiia vody v subpoliarnykh i teplykh lednikakh po dannym izmerenii skorosti rasprostraneniia radiovoln]

Frolov, A.D., Macheret, I.U.I.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.148-154, In Russian with English summary. 33 refs.

DLC QE575.A43

Glacier ice, Radio waves, Glacial hydrology, Ice dielectrics, Analysis (mathematics), Glacier surveys, Hydrothermal processes

53-4963

Avalanche formation as a process of self organization of regulated structures. [Lavinoobrazovanie kak protsess samoorganizatsii uporiadochennykh struktur]

Kazakov, N.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.155-157, In Russian with English summary. 5 refs.

DLC QE575.A43

Avalanche formation, Avalanche deposits, Nivation, Avalanche forecasting, Avalanche protection, Metamorphism (snow)

53-4964

Fluctuations of four glaciers of the Pamiro-Alay by lichenometric data. [Kolebaniiia chetyrex lednikov Pamiro-Alaia po likhenometricheskim dannym]

Solomina, O.N., Kamnianskii, G.M., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.158-164, In Russian with English summary. 14 refs.

DLC QE575.A43

Lichens, Glacier oscillation, Moraines, Age determination, Pamir-Alay, Russia—Koksa River

53-4965

Mudflow events at the territory of the USA and Canada. [Selevyie iavleniia na territorii SSHA i Kanady]

Sidorova, T.L., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.165-169, In Russian with English summary. 16 refs.

DLC QE575.A43

Mudflows, Maps, Classifications, Canada, United States

53-4966

Regime of the stable snow cover in the Greater Caucasus. [Rezhim ustoičhivogo snezhnogo pokrova na Bol'shom Kavkaze]

Pogorelov, A.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.170-175, In Russian with English summary. 14 refs.

DLC QE575.A43

Snow cover stability, Snow depth, Snow cover distribution, Slope orientation, Altitude, Statistical analysis, Russia—Caucasus

53-4967

Concentration, spectral distribution and ice forming properties of aerosols in the region of Nal'chik. [Kontsentratsiia, spektral'noe raspredeleniie i l'dobrazuiushchie svoïstva aerolei v raione g. Nal'chika]

Kerimov, A.N., Komalov, A.S., Stepanov, G.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.176-178, In Russian with English summary. 5 refs.

DLC QE575.A43

Aerosols, Ice nuclei, Ice formation, Particle size distribution, Polar atmospheres, Atmospheric composition, Russia—Nal'chik

53-4968

Study of typical tributaries of Buordakh glaciers. [Issledovanie kharakternykh pritokov lednikov Buordakha]

Sedov, R.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.179-183, In Russian with English summary. 3 refs.

DLC QE575.A43

Mountain glaciers, Glacial rivers, River basins, Glacier surveys, Russia—Cherski Range

53-4969

Wind role in fluctuations of Chukotka glaciers. [Rol' vetra v kolebaniiaakh lednikov Chukotki]

Sedov, R.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy gliatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.184-186, In Russian with English summary. 6 refs.

DLC QE575.A43

Glacier oscillation, Wind factors, Wind direction, Air flow, Snow air interface, Glacier surfaces, Snow accumulation, Moraines, Russia—Chukotskiy Peninsula

53-4970

Possibility of creation of an ecoprotective screen in the lower reaches of the hydro-power-plants. [O vozmozhnosti sozdaniia ledianogo ekoshchitnogo ekrana v nizhnikh b'efakh gidrouzlov]

Samoilov, R.S., Sosnovskii, A.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.187-190, In Russian with English summary. 5 refs.

DLC QE575.A43

Hydraulic structures, Electric power, Design, Ice cover, Artificial freezing, River ice, Environmental protection, Evaporation control

53-4971

Annotated bibliography of the Russian literature on glaciology for 1994-1995. [Annotirovannala bibliografiia russkoi glatsiologii za 1994-1995 gody]

Kotliakov, V.M., Chernova, L.P., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.191-212, In Russian with English summary. 358 refs.

DLC QE575.A43

Bibliographies, Glaciology, Ice physics, Ice composition, Snow cover, Avalanches, Sea ice, River ice, Lake ice, Naleds, Ground ice, Glaciers, Paleoclimatology

53-4972

Airborne radio-echo survey of the ice caps on Severnaya Zemlya, April-May 1997. [Vozdushnye radiolokatsionnye issledovaniia lednikovykh kupolov na Severnoi Zemle, april'-mai' 1997 g.]

Dowdeswell, J.A., et al, *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.213-217, In Russian with English summary. 7 refs.

DLC QE575.A43

Airborne radar, Radio echo soundings, Glacier surveys, Ice cover, Russia—Severnaya Zemlya

53-4973

Study of Argentina glaciers by Russian glaciologists. [Izuchenie lednikov Argentiny rossiiskimi glatsiologami]

Popovnin, V.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.218-223, In Russian with English summary.

DLC QE575.A43

Glacier surveys, Research projects, Glacier mass balance, Argentina

53-4974

First results of the two new projects of the deep core drilling on tropical glaciers. [Pervye rezul'taty dvukh novykh proektov glubokogo kernovogo bureniia na tropicheskikh lednikakh]

Thompson, L.G., Mikhalenko, V.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.224-228, In Russian with English summary. 4 refs.

DLC QE575.A43

Ice cores, Boreholes, Volcanoes, Ice temperature, Drill core analysis, Oxygen isotopes, Paleoclimatology, Mountain glaciers, Bolivia—Sajama, Bolivia—Andes, China—Tibet, Himalaya Mountains

53-4975

Glaciological problems at meetings of the Scientific Council of the Institute of Geography, RAS. [Voprosy glatsiologii na uchenom soвете Instituta geografii RAN]

Dreifer, N.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.229, In Russian.

DLC QE575.A43

Meetings, Glaciology, Research projects, Organizations

53-4976

Meetings of the scientific seminar on glaciology in 1997. [O rabote nauchnogo seminaru po glatsiologii v 1997 godu]

Rototaeva, O.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.230, In Russian.

DLC QE575.A43

Meetings, Glaciology, Research projects

53-4977

Meeting of the working group on the arctic glaciology, IASC, and discussion on mass balance of arctic glaciers, 28-29 January 1998. [Zasedanie rabochei gruppy po arkticheskoi glatsiologii IASC i soveshchanie po balansu massy arkticheskikh lednikov, Greginog (Velikobritaniia), 28-30 ianvaria 1998 g.]

Glazovskii, A.F., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, Feb. 1998, No.84, p.231-232, In Russian.

DLC QE575.A43

Meetings, Glaciology, Glacier mass balance, Research projects

53-4978

Recent studies on rapid mass movement in Japan with reference to debris hazards.

Okuda, S., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.5-22, With Polish and Russian summaries. 27 refs.

DLC QE260.S77 Vol.23 1989

Earthquakes, Volcanoes, Avalanches, Avalanche deposits, Mass movements (geology), Slope processes, Slope stability, Landslides, Japan

53-4979

High magnitude geomorphic events in the Canadian Rocky Mountains.

Gardner, J.S., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.39-51, With Polish and Russian summaries. 31 refs.

DLC QE260.S77 Vol.23 1989

Geomorphology, Landforms, Solifluction, Moraines, Rock glaciers, Slope processes, Glacial erosion, Snowmelt, Meltwater, Canada—Rocky Mountains

53-4980

Testing <sup>137</sup>Cs as an indicator of slope process activity in periglacial environments.

Strömquist, L., Jonasson, C., Robinson, C., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.93-104, With Polish and Russian summaries. 13 refs.

DLC QE260.S77 Vol.23 1989

Radioactive isotopes, Slope processes, Periglacial processes, Radioactivity, Runoff, Soil chemistry, Talus, Sedimentation, Fallout, Mass movements (geology), Sweden, Norway

53-4981

On the age of debris flows in the Tatra Mountains.

Kotarba, A., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.139-152, With Polish and Russian summaries. 16 refs.

DLC QE260.S77 Vol.23 1989

Alluvium, Talus, Geomorphology, Lichens, Age determination, Slope processes, Mass movements (geology), Rain, Precipitation (meteorology), Poland—Tatra Mountains

53-4982

Types and extent of soil degradation in Hungary.

Pinczés, Z., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.153-162, With Polish and Russian summaries. 7 refs.

DLC QE260.S77 Vol.23 1989

Frost action, Degradation, Talus, Soil creep, Mudflows, Frozen ground, Ground thawing, Soil erosion, Raindrops, Meltwater, Hungary

53-4983

Cycles of the Ice Age—an Ice Age-theory based on the reconstruction of a Tibetan Ice Sheet. [Khod lednikovoi epokhi—teoriia, osnovannala na rekonstruktsii tibetskogo lednikovogo pokrova]

Kuhle, M., *Studia geomorphologica Carpatho-Balcanica*, 1989, Vol.23, p.163-186, In Russian with English and Polish summaries. 24 refs.

DLC QE260.S77 Vol.23 1989

Ice age theory, Glaciers, Moraines, Outwash, Radiation balance, Glaciation, Ice cover, Glacial deposits, Paleoclimatology, Insolation, China—Tibet

53-4984

Contributions to permafrost research in Austria. [Beiträge zur Permafrostforschung in Österreich]

Leitner, W., ed, *Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten*, 1996, Vol.33, 223p. + 7 fold. maps, In German with English summaries. Refs. passim. For individual papers see 53-4985 through 53-4991.

DLC GB648.47.B45 1996

Permafrost, Research projects, Rock glaciers, Glacier surfaces, Mapping, Austria

53-4985

Permafrost and rock glaciers in the eastern Austrian Alps. [Permafrost und Blockgletscher in den östlichen österreichischen Alpen]

Lieb, G.K., *Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten*, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.9-124 + append., In German with English summary. Refs. p.118-123.

DLC GB648.47.B45 1996

Permafrost distribution, Rock glaciers, Geomorphology, Glacier surveys, Periglacial processes, Mapping, Snow cover, Snow temperature, Discontinuous permafrost, Springs (water), Water temperature, Seismic velocity, Soil temperature, Austria—Alps

53-4986

Trend surfaces in geography: the example of the lower limits of intact rock glaciers in the Hohe Tauern range. [Trendflächen in der Geographie am Beispiel der Untergrenzen der intakten Blockgletscher in den Hohen Tauern]

Gspurning, J., *Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten*, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.127-139, In German with English summary. 15 refs.

DLC GB648.47.B45 1996

Rock glaciers, Glacier surveys, Mathematical models, Glacier surfaces, Austria—Hohe Tauern

53-4987

Dösen rock glacier: study maps and measurements of surface velocity. [Der Dösen Blockgletscher: Studienkarten und Bewegungsmessungen]

Kaufmann, V., *Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten*, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.141-162, In German with English summary. 50 refs.

DLC GB648.47.B45 1996

Rock glaciers, Maps, Glacier surfaces, Velocity measurement, Glacier flow, Glacier oscillation, Geodetic surveys, Austria—Hohe Tauern

53-4988

Complex geophysical investigations on Dösen rock glacier (Hohe Tauern range, Austria). [Komplex-geophysikalische Untersuchung auf dem Dösen Blockgletscher (Hohe Tauern, Österreich)]

Schmöllner, R., Fruhwirth, R.K., *Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten*, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.165-190, In German with English summary. 20 refs.

DLC GB648.47.B45 1996

Rock glaciers, Geophysical surveys, Permafrost thickness, Electromagnetic prospecting, Seismic surveys, Austria—Hohe Tauern

53-4989

Photo-maps by remotely sensed data: technical production and interpretative use by geographers. [Bildkarten aus Fernerkundungsdaten: Herstellung und geographisch-interpretative Nutzung. Mit einer Luftbildkarte des östlichen Tauernmassivs]

Sege, M., Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.191-199, In German with English summary. 6 refs.

DLC GB648.47.B45 1996

Remote sensing, Sensor mapping, Photointerpretation, Topographic maps

53-4990

Investigations on a fossil rock-glacier in the region of Hochreichart (Niedere Tauern Range, Styria, Austria). [Untersuchungen an einem fossilen Blockgletscher im Hochreichartgebiet (Niedere Tauern, Steiermark)]

Untersweg, T., Proske, H., Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.201-207, In German with English summary. 8 refs.

DLC GB648.47.B45 1996

Rock glaciers, Water reserves, Glacial hydrology, Springs (water), Austria—Styria

53-4991

Undercooled talus. [Unterkühlte Schutthalde]

Wakonigg, H., Graz. Karl-Franzens-Universität. Institut für Geographie. Arbeiten, 1996, Vol.33, Beiträge zur Permafrostforschung in Österreich (Contributions to permafrost research in Austria). Edited by W. Leitner, p.209-223, In German with English summary. 36 refs.

DLC GB648.47.B45 1996

Talus, Permafrost origin, Swamps, Latent heat, Permafrost distribution, Snow melting, Ice melting, Ice air interface, Snow air interface, Austria—Alps

53-4992

International Program of the research of the Arctic Climate System. [Mezhdunarodnaya programma "Issledovaniia arkticheskoi klimaticheskoj sistemy"]

Alekseev, G.V., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.5-14, In Russian with English summary. 12 refs.

DLC G575.L422 Vol.69 1995

Meetings, Research projects, International cooperation, Organizations, Climatology, Polar atmospheres, Sea ice, Ocean currents, Models

53-4993

Sea ice in the climate system. [Morskoe l'dy v klimaticheskoj sisteme]

Zakharov, V.F., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.15-26, In Russian with English summary.

DLC G575.L422 Vol.69 1995

Sea ice distribution, Seasonal variations, Air ice water interaction, Pleistocene, Ice cover effect

53-4994

Ocean/atmosphere interaction and climate dynamic for high and mid latitudes. [Vzaimodeistvie okeana i atmosfery i dinamika klimata v vysokikh i umerennykh shirotakh]

Alekseev, G.V., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.27-37, In Russian with English summary. 7 refs.

DLC G575.L422 Vol.69 1995

Air water interactions, Polar atmospheres, Air temperature, Ice cover effect, Air ice water interaction, Mathematical models, Advection

53-4995

Climate monitoring of atmosphere for the northern polar region. [Monitoring klimata severnoi polarnoi oblasti]

Aleksandrov, E.I., Maistrova, V.V., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.38-52, In Russian with English summary. 18 refs.

DLC G575.L422 Vol.69 1995

Polar atmospheres, Air temperature, Temperature variations, Data processing

53-4996

Peculiarities of sea ice study to provide the work on the Arctic shelf. [Osobennosti izucheniia morskikh l'dov dlia obespecheniia rabot na arkticheskoi shel'fe]

Spichkin, V.A., Minonov, E.U., Egorov, A.G., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.53-63, In Russian with English summary. 7 refs.

DLC G575.L422 Vol.69 1995

Sea ice, Ice conditions, Ice cover thickness, Seasonal variations, Hummocks

53-4997

Dynamics of arctic radiation climate. [Dinamika radiatsionnogo klimata Arktiki]

Marshunova, M.S., Radionov, V.F., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.64-73, In Russian with English summary. 7 refs.

DLC G575.L422 Vol.69 1995

Radiation balance, Cloud cover, Meteorology, Clouds (meteorology), Polar atmospheres, Albedo, Transparency, Aerosols

53-4998

Resemblance and special features of large scale phenomena in the southern and northern polar region. [Sootvetstviia i razlichia krupnomasshtabnykh geofizicheskikh iavlenii v severnoi i iuzhnoi poliar'nykh oblastakh]

Besprozvannai, A.S., Troshichev, O.A., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.74-91, In Russian with English summary. 49 refs.

DLC G575.L422 Vol.69 1995

Geophysical surveys, Solar radiation, Seasonal variations, Geomagnetism, Electric fields, Polar atmospheres, Stratosphere

53-4999

Climate changing in the Antarctica for the latest 220 thousand years according to the results of the investigations of ice core from the deep hole at the Vostok Station. [Izmenenie klimata v Antarktide za poslednie 220 tysia let po rezul'tatam issledovaniia ledianogo kerna iz glubokoi skvazhiny na stantsii Vostok]

Barkov, N.I., Lipenkov, V.I.A., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.92-107, In Russian with English summary. 31 refs.

DLC G575.L422 Vol.69 1995

Climatic changes, Boreholes, Paleoclimatology, Ice cores, Drill core analysis, Isotope analysis, Statistical analysis, Pleistocene, Air temperature, Hydrates, Oxygen isotopes, Antarctica—Vostok Station, Greenland—Summit

53-5000

Calculation of characteristics of the Yamal Peninsula river annual discharge. [Raschet kharakteristik godovogo stoka rek poluostr'ova Iamal]

Gopchenko, E.D., Loboda, N.S., Iagotintseva, T.V., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.108-115, In Russian with English summary. 18 refs.

DLC G575.L422 Vol.69 1995

Analysis (mathematics), Rivers, River flow, Runoff, Economic development, Natural resources, Water balance, Russia—Yamal Peninsula

53-5001

Seasonal and spatial changes of average velocities of ice drift and gradient currents in the Eastern-Greenland ice flow. [Sezonnye i prostranstvennye izmeneniia srednikh skorostei dreifa l'da i gradientnykh techenii v Vostochno-Grenlandskom ledovom potoke]

Gudkovich, Z.M., Pozdnyshnev, S.P., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.116-123, In Russian with English summary. 22 refs.

DLC G575.L422 Vol.69 1995

Seasonal variations, Drift, Velocity, Sea ice, Ocean currents, Wind velocity, Air ice water interaction, Greenland Sea

53-5002

Results of the experimental research of ice dielectric constant within 1-100 Hz frequency range. [Rezul'taty eksperimental'nykh issledovaniia dielektricheskoi pronitsaemosti l'da v diapozone chastoty 1-100 Gts]

Shchennikov, D.L., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.124-128, In Russian with English summary. 5 refs.

DLC G575.L422 Vol.69 1995

Ice dielectrics, Ice electrical properties, Sea ice, Analysis (mathematics)

53-5003

Possibilities of long-term forecasting of oceanographic conditions in terms of long-range communication. [Vozmozhnost' dolgosrochnogo prognozirovaniia okeanologicheskikh uslovii s ucheto m dal'nikh svyazei]

IAnes, A.V., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.69, p.129-133, In Russian with English summary. 14 refs.

DLC G575.L422 Vol.69 1995

Long range forecasting, Oceanography, Sea ice distribution, Air temperature, Air ice water interaction, Mathematical models, Russia—Kara Sea, Antarctica—Mirny Station

53-5004

Frigid mistress: life and exploration in Antarctica.

Doumani, G.A., Baltimore, MD, Noble House, 1999, 274p., 20 refs.

DLC G872.A46 D68 1999

Expeditions, History, Human factors, Antarctica

53-5005

Arctic and Antarctic Research Institute—the centre of the polar science of Russia. [Arkticheskii i antarktickii nauchno-issledovatel'skii institut—tsentr rossiiskoi poliar'noi nauki]

Baskakov, G.A., et al, Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.70, p.6-32, In Russian with English summary. 5 refs.

DLC G575.L422 Vol.70 1995

Research projects, Organizations, History, Russia

53-5006

Main scientific-applied results of the AARI activity with Hydrometeorological Service. [Osnovnye nauchno-prikladnye rezul'taty deiatel'nosti AANII v sisteme Gidrometosluzhby]

Krutsikh, B.A., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.70, p.33-44, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Organizations, Research projects, History, Hydrology, Meteorology

53-5007

Modern conditions and prospects of studies in the Arctic. [Sovremennoe sostoiianie i perspektivy nauchnykh issledovaniia v Arktike]

Frolov, I.E., Problemy arktiki i antarkтики; sbornik statei, 1995, Vol.70, p.45-49, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Research projects, History

## 53-5008

Arctic Institute during the Great Patriotic War (by the 50th anniversary of the V-Day of the Great Patriotic War). [Arkticheskiy institut v gody Velikoy Otechestvennoy voiny (k 50-letiyu Pobedy v Velikoy Otechestvennoy voiny)]

Voevodin, V.A., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.50-57, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Organizations, History, Military operation

## 53-5009

Main results of studying and forecasting the arctic sea ice. [Osnovnye itogi izucheniya i prognozirovaniya morskikh l'dov Arktiki]

Krutsikh, B.A., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.58-74, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Sea ice, Ice forecasting, Ice conditions, History, Research projects

## 53-5010

Studies of dynamics and structure of the Arctic Ocean ice cover. [Issledovaniya dinamiki i stroeniya ledianogo pokrova Severnogo Ledovitogo okeana]

Gorbunov, I.U.A., Gudkovich, Z.M., Losev, S.M., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.75-83, In Russian with English summary. 29 refs.

DLC G575.L422 Vol.70 1995

Sea ice, Ice cover, History, Research projects, Drift, Arctic Ocean

## 53-5011

Main results and prospects of the southern ocean ice regime studies. [Osnovnye itogi i perspektivy issledovaniy ledovogo rezhima IJzhnogo okeana]

Korotkov, A.I., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.84-103, In Russian with English summary. 61 refs.

DLC G575.L422 Vol.70 1995

Ice conditions, Ice cover, Sea ice, History, Research projects, Drift, Antarctica

## 53-5012

Observations and studies of sea ice, development of the automated system for ice data. [Nabliudeniya za morskimi l'dami i ikh issledovaniya, sozdanie avtomatizirovannoy ledovo-informatsionnoy sistemy]

Bushuev, A.V., Volkov, N.A., Grishchenko, V.D., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.104-119, In Russian with English summary. 37 refs.

DLC G575.L422 Vol.70 1995

Ice cover, Sea ice, Data processing, History, Remote sensing, Research projects, Ice surveys, Ice reporting

## 53-5013

Methods and results of studies of ice, snow and water physical characteristics for the polar regions. [Metody i rezul'taty izucheniya fizicheskikh kharakteristik l'da, snega i vodnykh mass polarnykh raionov]

Lebedev, G.A., Gavrilov, V.P., Spitsyn, V.A., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.120-142, In Russian with English summary. 90 refs.

DLC G575.L422 Vol.70 1995

Research projects, History, Sea ice, Ice cover, Ice acoustics, Ice electrical properties, Remote sensing

## 53-5014

Results and prospects of works of the "Ship Performance in Ice" Department. [Itogi i perspektivy raboty otdela ledovykh kachestv sudov]

Likhomanov, V.A., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.143-149, In Russian with English summary. 1 ref.

DLC G575.L422 Vol.70 1995

History, Research projects, Ice navigation, Ships

## 53-5015

Oceanographic investigations in the Arctic. [Okeanograficheskie issledovaniya v Arktike]

Nikiforov, E.G., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.150-171, In Russian with English summary. 44 refs.

DLC G575.L422 Vol.70 1995

Oceanography, History, Research projects, Sea water, Water temperature, Oceanographic surveys

## 53-5016

Oceanographic investigations in the southern ocean. [Okeanograficheskie issledovaniya IJzhnogo okeana]

Antipov, N.N., Botnikov, V.N., Klepikov, A.V., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.172-182, In Russian with English summary. 12 refs.

DLC G575.L422 Vol.70 1995

History, Research projects, Oceanography, Oceanographic surveys, Antarctica

## 53-5017

Hydrochemical research of polar oceans. [Gidrokhimicheskie issledovaniya polarnykh okeanov]

Smagin, V.M., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.183-192, In Russian with English summary. 21 refs.

DLC G575.L422 Vol.70 1995

Hydrology, History, Research projects, Sea water, Water chemistry

## 53-5018

Air/ocean interaction in the polar regions.

[Vzaimodeystvie atmosfery i okeana v polarnykh raionakh]

Alekseev, G.V., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.193-202, In Russian with English summary. 34 refs.

DLC G575.L422 Vol.70 1995

Air water interactions, Heat balance, Global warming, Climatic changes, Air ice water interaction, History

## 53-5019

Discovery of the Lomonosov Ridge. [Otkrytie khrebtta Lomonosova]

Zakharov, V.F., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.203-215, In Russian with English summary. 13 refs.

DLC G575.L422 Vol.70 1995

History, Drift stations, Bottom topography, Expeditions, Research projects, Arctic Ocean

## 53-5020

Polar meteorology: its development and prospects. [Pollarnaya meteorologiya: stanovlenie i razvitiye]

Voskresenskiy, A.I., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.216-245, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Polar atmospheres, Meteorology, History, Research projects, Environmental impact, Solar radiation, Air temperature, Atmospheric circulation, Snow cover effect, Clouds (meteorology), Ozone, Antarctica

## 53-5021

Macrocirculative method of long-term meteorological forecasts for the polar areas of the Earth. [Makrotsirkulyatsionnyy metod dolgosrochnykh meteorologicheskikh prognozov dlia polarnykh oblastey]

Vinogradov, N.D., Ivanov, V.V., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.246-254, In Russian with English summary.

DLC G575.L422 Vol.70 1995

Atmospheric circulation, Polar atmospheres, History, Research projects, Long range forecasting, Weather forecasting, Meteorology

## 53-5022

Polar geophysics at the AARI: the history, modern state and prospects. [Pollarnaya geofizika v AANII: istoriya, sovremennyy status i perspektivy]

Troshichev, O.A., Shirochikov, A.V., Blagoveshchenskiy, N.F., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.255-270, In Russian with English summary.

DLC G575.L422 Vol.70 1995

History, Research projects, Geophysical surveys, Geomagnetism, Radio waves, Monitors, Organizations, Northern Sea Route

## 53-5023

Geographical investigations of the polar countries. [Geograficheskie issledovaniya polarnykh stran]

Aver'ianov, V.G., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.271-292, In Russian with English summary. 82 refs.

DLC G575.L422 Vol.70 1995

Geography, History, Research projects, Expeditions, Antarctica

## 53-5024

Polar medicine: results and prospects. [Pollarnaya meditsina: itogi i perspektivy]

Klopov, V.P., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.293-304, In Russian with English summary. 44 refs.

DLC G575.L422 Vol.70 1995

History, Health, Human factors, Expeditions, Cold exposure, Physiological effects, Antarctica

## 53-5025

Arctic and Antarctic Museum. [Muzey Arktiki i Antarkтики]

IAGodnitsyn, N.G., *Problemy arktiki i antarkтики; sbornik statei*, 1995, Vol.70, p.305-311, In Russian with English summary.

DLC G575.L422 Vol.70 1995

History, Organizations, Education

## 53-5026

Effective stress creep model for frozen sand.

Ji, Z.L., Winnipeg, University of Manitoba, 1996, 236p., University Microfilms order No.NN-13215, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(10), p.6420.

Sands, Frozen ground strength, Frozen ground compression, Soil structure, Soil creep, Ground ice, Shear strength, Stress strain diagrams

## 53-5027

Submarine drainage system of the Labrador Sea: result of glacial input from the Laurentide Ice Sheet.

Klaucke, I., Montreal, McGill University, 1995, 384p., University Microfilms order No.NN-08122, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(4), p.2443.

Marine geology, Ocean bottom, Bottom sediment, Bottom topography, Ocean currents, Glaciation, Ice sheets, Glacial erosion, Outwash, Glacial deposits, Ice rafting, Sediment transport, Paleoclimatology, Labrador Sea

## 53-5028

Experimental investigation of metamorphism-induced microstructure evolution in a "model" cohesive snow.

Edens, M.Q., Bozeman, Montana State University, 1997, 114p., University Microfilms order No.98-04843, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 58(8), p.4308.

Snow cover structure, Microstructure, Metamorphism (snow), Ice crystal size, Ice crystal replicas, Image processing, Computer programs

53-5029

**Investigation of mass balance parameters on the Greenland Ice Sheet using passive microwave satellite data.**

Abdalati, W., Boulder, University of Colorado, 1996, 131p., University Microfilms order No.96-28513, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(4), p.2440.  
Glacier surveys, Ice sheets, Glacier oscillation, Glacier mass balance, Glacial meteorology, Climatic changes, Radiometry, Spaceborne photography, Greenland

53-5030

**Role of snow cover in the climate system.**

Clark, M.P., Boulder, University of Colorado, 1998, 108p., University Microfilms order No.9838347, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 59(6), p.2649.  
Snow air interface, Snow heat flux, Snow cover effect, Atmospheric circulation, Computerized simulation, Statistical analysis

53-5031

**Study of dilution-based cratering effects with application to the degradation of anti-icing films.**  
La Due, J.C., New Brunswick, NJ, Rutgers State University, 1996, 188p., University Microfilms order No.9711077, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(11), p.7194.  
Aircraft icing, Ice accretion, Chemical ice prevention, Ice removal, Films, Interfacial tension, Surfactants

53-5032

**Characterization of seasonal backscatter change in subarctic wetlands and river ice breakup using radarsat data.**

Murphy, M.A., Ontario, Canada, University of Guelph, 1999, 196p., University Microfilms order No.MQ35918, M.S. thesis. For abstract see Masters abstracts international, 37(4), p.1169.  
River ice, Ice conditions, Ice detection, Ice breakup, Ice forecasting, Wetlands, Synthetic aperture radar, Backscattering, Spaceborne photography, Image processing, Canada—Hudson Bay

53-5033

**Some effects of highway de-icing on adjacent soils and vegetation.**

Squire, B.J., Calgary, Canada, University of Calgary, 1993, 154p., University Microfilms order No.MM83256, M.S. thesis. For abstract see Masters abstracts international, 32(2), p.575.  
Road icing, Salting, Chemical ice prevention, Environmental impact, Soil pollution, Plant physiology, Road maintenance, Canada

53-5034

**Microclimate and geomorphic responses to wild-fire in a subarctic upland forest underlain by permafrost.**

Lesemann, J.E., Edmonton, University of Alberta, 1998, 136p., University Microfilms order No.MQ34389, M.S. thesis. For abstract see Masters abstracts international, 37(3), p.861.  
Forest fires, Permafrost distribution, Permafrost thickness, Permafrost heat balance, Permafrost weathering, Active layer, Thaw depth, Thermokarst, Forest tundra, Forest land, Vegetation patterns, Revegetation, Plant ecology, Soil erosion, Microclimatology, Canada—Northwest Territories—Fort Norman

53-5035

**Effect of detachment sliding on surface wash erosion in the continuous permafrost zone, Hot Weather Creek, Fosheim Peninsula, Ellesmere Island, Northwest Territories.**

Kokelj, S.V., Ottawa, Canada, University of Ottawa, 1998, 212p., University Microfilms order No.MQ36709, M.A. thesis. For abstract see Masters abstracts international, 37(4), p.1166.  
Permafrost hydrology, Active layer, Periglacial processes, Slope processes, Solifluction, Nivation, Snow cover effect, Vegetation patterns, Vegetation factors, Snowmelt, Surface drainage, Soil erosion, Canada—Northwest Territories—Ellesmere Island

53-5036

**Dependence of snow thermal and electrical conductivities on microstructure.**

Arons, E.M., Hanover, NH, Dartmouth College, 1994, 176p., University Microfilms order No.9527890, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, Oct. 1995, 56(4), p.1902.  
Snow cover structure, Microstructure, Metamorphism (snow), Snow electrical properties, Snow thermal properties, Snow heat flux, Electrical resistivity, Thermal conductivity

53-5037

**Estimation of iceberg density in the Grand Banks of Newfoundland.**

Kelly, R., Montreal, McGill University, 1996, 133p., University Microfilms order No.MM-12122, M.E. thesis. For abstract see Masters abstracts international, 35(1), p.298.  
Icebergs, Ice conditions, Ice forecasting, Drift, Ice reporting, Statistical analysis, Canada—Newfoundland—Grand Banks

53-5038

**Estimation of snow depth and snow water equivalent using passive microwave radiation data.**

Tait, A.B., Boulder, University of Colorado, 1996, 147p., University Microfilms order No.96-28602, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(4), p.2442. For another version see 51-2503.

Snow surveys, Snow hydrology, Snow depth, Snow density, Depth hoar, Snow water equivalent, Radiometry, Runoff forecasting, Snowmelt, Statistical analysis

53-5039

**Sensitivity of Late Quaternary climates to changes in Northern Hemisphere ice sheets: experiments with a general circulation model.**

Felzer, B.S., Providence, RI, Brown University, 1996, 214p., University Microfilms order No.97-04021, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 57(9), p.5708.  
Glaciation, Ice sheets, Glacier oscillation, Glacial meteorology, Atmospheric circulation, Ice age theory, Global change, Ice models, Paleoclimatology, Computerized simulation

53-5040

**New technologies in urban drainage, UDT '91.**  
International Conference on Urban Drainage and New Technologies, Dubrovnik, Yugoslavia, June 17-21, 1991, Maksimović, C., London, Elsevier Science Publishers, Ltd., 1991, 535p., Refs. passim. For selected papers see 47-1685 and 53-5041 through 53-5044.

DLC TD653.N48 1991

Urban planning, Sanitary engineering, Water pollution, Drainage, Snowmelt, Snow removal

53-5041

**Migration pathways for PAHs in the urban environment.**

Sharma, M., McBeen, E., Marsalek, J., International Conference on Urban Drainage and New Technologies, Dubrovnik, Yugoslavia, June 17-21, 1991, New technologies in urban drainage, UDT '91. Edited by C. Maksimović, London, Elsevier Science Publishers, Ltd., 1991, p.217-224, 24 refs.

DLC TD653.N48 1991

Scavenging, Snow impurities, Snowmelt, Snow removal, Water pollution, Sanitary engineering, Urban planning, Health, Drains

53-5042

**Urban drainage in cold climate: problems, solutions and research needs.**

Marsalek, J., International Conference on Urban Drainage and New Technologies, Dubrovnik, Yugoslavia, June 17-21, 1991. New technologies in urban drainage, UDT '91. Edited by C. Maksimović, London, Elsevier Science Publishers, Ltd., 1991, p.299-308, 36 refs.

DLC TD653.N48 1991

Snow removal, Snowmelt, Water pollution, Health, Sanitary engineering, Drains, Drainage, Urban planning, Cold weather operation

53-5043

**Use of conceptual hydrological models for modeling urban runoff from precipitation and snowmelt.**

Thorolfsson, S.T., Killingtveit, Å., International Conference on Urban Drainage and New Technologies, Dubrovnik, Yugoslavia, June 17-21, 1991. New technologies in urban drainage, UDT '91. Edited by C. Maksimović, London, Elsevier Science Publishers, Ltd., 1991, p.317-324, 7 refs.

DLC TD653.N48 1991

Snow hydrology, Snowfall, Snowmelt, Runoff forecasting, Drainage, Sanitary engineering, Urban planning, Norway

53-5044

**Chloride export in runoff from suburban areas during spring snowmelt.**

Vonk, A.M., Buttle, J.M., Taylor, C.H., International Conference on Urban Drainage and New Technologies, Dubrovnik, Yugoslavia, June 17-21, 1991. New technologies in urban drainage, UDT '91. Edited by C. Maksimović, London, Elsevier Science Publishers, Ltd., 1991, p.347-354, 12 refs.

DLC TD653.N48 1991

Salting, Road maintenance, Snowmelt, Water pollution, Sanitary engineering, Urban planning, Canada—Ontario

53-5045

**Deformation of seabed soil under ice scouring and burial depth for marine pipelines.**

Yin, J.H., Yuan, J.X., Deformation and progressive failure in geomechanics. IS-NAGOYA '97. Proceedings. Edited by A. Asaoka, T. Adachi and F. Oka, Oxford, Elsevier Science, Ltd., 1997, p.443-448, 3 refs.

DLC TA703.5.D44 1997

Icebergs, Ice scoring, Ice erosion, Ocean bottom, Bottom topography, Bottom sediment, Underground pipelines

53-5046

**Rockfalls, landslides, and slope failure.**

Chau, K.T., Deformation and progressive failure in geomechanics. IS-NAGOYA '97. Proceedings. Edited by A. Asaoka, T. Adachi and F. Oka, Oxford, Elsevier Science, Ltd., 1997, p.907-921, Refs. p.918-921.

DLC TA703.5.D44 1997

Slope stability, Slope processes, Talus, Landslides, Mudflows, Avalanche formation, Avalanche mechanics, Mathematical models, Hong Kong

53-5047

**Design considerations for coastal projects in cold regions.**

Leidersdorf, C.B., Gadd, P.E., Vaudrey, K.D., International Conference on Coastal Engineering 1996, 25th, Orlando, FL, Sep. 2-6, 1996. Proceedings. Vol.4. Edited by B.L. Edge, New York, American Society of Civil Engineers, 1997, p.4397-4410, 20 refs.

DLC TC203.5.C6184 1997 Vol.4

Offshore structures, Artificial islands, Ice push, Ice pileup, Ice override, Ice loads, Ice control, Concrete durability, Frost protection, Cold weather construction, Beaufort Sea, United States—Alaska

53-5048

**Experimental study on deformation and fracture of ice sheet by propagating water wave.**

Sakai, S., Liu, X.D., Sasamoto, M., Kanada, S., Izumiya, K., International Conference on Coastal Engineering 1996, 25th, Orlando, FL, Sep. 2-6, 1996. Proceedings. Vol.4. Edited by B.L. Edge, New York, American Society of Civil Engineers, 1997, p.4411-4417, 2 refs.

DLC TC203.5.C6184 1997 Vol.4

Ocean waves, Wave propagation, Ice water interface, Ice cover strength, Ice elasticity, Ice deformation, Ice cracks, Ice breaking



## 53-5049

Observations of the falling motion of plate-like snow crystals. Part II: the free-fall patterns and velocity variations of rimed crystals.

Kajikawa, M., Okuhara, K., *Meteorological Society of Japan. Journal*, Aug. 1997, 75(4), p.811-818, With Japanese summary. 11 refs.

Falling snow, Snowflakes, Snow crystal growth, Snow crystal structure, Coalescence, Ice crystal size, Ice crystal adhesion, Velocity measurement

## 53-5050

Geometric model for the Beaufort/Chukchi Sea thermohaline structure.

Chu, P.C., Wang, Q.Q., Bourke, R.H., *Journal of atmospheric and oceanic technology*, June 1999, 16(6), p.613-632, 9 refs.

Oceanographic surveys, Ocean currents, Water transport, Sea water, Water temperature, Salinity, Ice water interface, Statistical analysis, Mathematical models, Chukchi Sea, Beaufort Sea

## 53-5051

Land surface process/radiobrightness model with coupled heat and moisture transport for prairie grassland.

Liou, Y.A., Galantowicz, J.F., England, A.W., *IEEE transactions on geoscience and remote sensing*, July 1999, 37(4), p.1848-1859, 45 refs.

Plains, Meadow soils, Soil temperature, Soil water, Soil air interface, Heat balance, Heat flux, Moisture transfer, Evapotranspiration, Radiometry, Mathematical models

## 53-5052

Airborne retrievals of snow and ice surface emissivity at millimeter wavelengths.

Hewison, T.J., English, S.J., *IEEE transactions on geoscience and remote sensing*, July 1999, 37(4), p.1871-1879, 27 refs.

Snow surveys, Ice surveys, Ice detection, Snow ice interface, Snow surface temperature, Ice conditions, Radiance, Radiometry, Ice optics, Snow optics, Finland

## 53-5053

Automated instrumentation for continuous monitoring of the dielectric properties of woody vegetation: system design, implementation, and selected *in situ* measurements.

McDonald, K.C., Zimmermann, R., Way, J., Chunn, W., *IEEE transactions on geoscience and remote sensing*, July 1999, 37(4), p.1880-1894, 51 refs.

Taiga, Trees (plants), Plant tissues, Plant physiology, Evapotranspiration, Forest canopy, Plant ecology, Moisture detection, Dielectric properties

## 53-5054

Seasonal comparison of HUTSCAT ranging scatterometer and ERS-1 SAR microwave signatures of boreal forest zone.

Koskinen, J.T., Pulliainen, J.T., Mäkinen, M.P., Hallikainen, M.T., *IEEE transactions on geoscience and remote sensing*, July 1999, 37(4), p.2068-2079, 20 refs.

Taiga, Forest land, Forest canopy, Terrain identification, Snow surveys, Snow cover distribution, Snow depth, Snow density, Snow water equivalent, Synthetic aperture radar, Backscattering, Finland

## 53-5055

Behavior of pair of leaning arch-shells under snow and wind loads.

Molloy, S.J., Plaut, R.H., Kim, J.Y., *Journal of engineering mechanics*, June 1999, 125(6), p.663-667, 20 refs.

Portable shelters, Snow loads, Wind pressure, Structural analysis

## 53-5056

Climatological investigations into a more precise layout of the frost penetration areas in the State of Brandenburg. [Klimatologische Untersuchungen zur Präzisierung der Frosteinwirkungszonen im Land Brandenburg]

Kirchner, S., Plehm, T., *Straße und Autobahn*, Apr. 1999, 50(4), p.183-185, In German. 3 refs.

Freezing indexes, Degree days, Frost penetration, Frost forecasting, Weather forecasting, Road maintenance, Highway planning, Germany

## 53-5057

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## 53-5061

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Stations, Research projects, Traverses, Logistics, Cold weather operation, Expeditions, Antarctica—Showa Station, Antarctica—Dome Fuji Station

## 53-5062

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## 53-5063

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Ice coring drills, Ice cores, Drilling, Coring, Antarctica—Dome Fuji Station

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## 53-5068

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Marine geology, Marine deposits, Bottom sediment, Quaternary deposits, Soil dating, Fossils, Palynology, Drill core analysis, Radioactive age determination, Paleoclimatology, Norway

## 53-5069

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## 53-5070

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53-5071

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53-5072

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53-5079

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53-5087

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53-5088

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53-5089

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53-5093

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53-5099

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53-5102

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53-5103

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53-5104

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53-5105

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53-5106

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53-5107

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53-5108

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Polar atmospheres, Atmospheric composition, Aerosols, Scavenging, Snow composition, Snow samplers, Mineralogy, Geochemical cycles, Antarctica

53-5109

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53-5110

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Ice surveys, Sea ice distribution, Ice conditions, Ice edge, Ice detection, Radiometry, Spaceborne photography, Antarctica

53-5111

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Sea water freezing, Ice formation, Ice growth, Sea ice distribution, Ice edge, Drift, Ice cover effect, Ice heat flux, Air ice water interaction, Ocean currents, Water transport, Convection, Global change, Greenland Sea

## 53-5112

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## 53-5113

**Surficial sediments, permafrost, and geomorphic processes, Kikerk Lake and Coppermine map areas, west Kitikmeot, District of Mackenzie, Northwest Territories.**

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## 53-5114

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Lake effects, Snowstorms, Snowfall, Snow depth, Records (extremes), United States—New York

## 53-5115

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Geological surveys, Permafrost surveys, Permafrost thickness, Permafrost indicators, Glacial deposits, Glacial till, Outwash, Ground ice, Fossil ice, Subsurface investigations, Electromagnetic prospecting, Canada—Northwest Territories

## 53-5116

**Surficial geology of the Contwoyto Lake map area (north half), District of Mackenzie, Northwest Territories.**

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Geological surveys, Glacial geology, Glacial deposits, Glacial till, Outwash, Alluvium, Permafrost surveys, Periglacial processes, Ground ice, Fossil ice, Canada—Northwest Territories—Contwoyto Lake

## 53-5117

**Last glacial ice flows over western Meta Incognita Peninsula, southern Baffin Island, Northwest Territories.**

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## 53-5118

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Geological surveys, Glacial geology, Glacier flow, Glacial deposits, Glacial till, Lacustrine deposits, Quaternary deposits, Striations, Exploration, Geochemistry, Stratigraphy, Canada—Ontario—Timmins

## 53-5119

**Comparison of geochemical sample media: till and lake sediment data, central Labrador.**

Klassen, R.A., Rencz, A.N., Moore, A., Canada. *Geological Survey. Current research. Part C*, 1997, No.1997-C, p.235-245, With French Summary. 26 refs.

DLC QE48.C2 1997-C

Geological surveys, Exploration, Glacial deposits, Glacial till, Lacustrine deposits, Geochemistry, Minerals, Natural resources, Canada—Labrador

## 53-5120

**Ground ice volumes determined from shallow cores from western Fosheim Peninsula, Ellesmere Island, Northwest Territories.**

Hodgson, D.A., Nixon, F.M., Canada. *Geological Survey. Bulletin*, 1998, No.507, 178p., MIC-98-04388, With French summary. 37 refs.

Permafrost surveys, Permafrost thickness, Permafrost structure, Ground ice, Fossil ice, Ice wedges, Marine deposits, Quaternary deposits, Soil classification, Well logging, Core samplers, Canada—Northwest Territories—Ellesmere Island

## 53-5121

**Cold regions engineering: putting research into practice; Proceedings.**

International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999, Zufelt, J.E., ed, MP 5385, Reston, VA, American Society of Civil Engineers (ASCE), 1999, 901p., Refs. passim. For individual papers see 53-5122 through 53-5203.

DLC TA713.C635 1999

Cold weather construction, Stations, Utilities, Buildings, Foundations, Road maintenance, Pavements, Permafrost beneath structures, Permafrost preservation, Frozen ground strength, Subgrade soils, Soil freezing, Frost heave, Thaw weakening, Soil stabilization, Frost protection, River ice, Ice loads, Ice control, Power line icing

This proceedings is a compilation of the technical papers presented at the Tenth International Conference on Cold Regions Engineering held in Lincoln, NH on Aug. 16-19, 1999. Nine topic areas discuss the application of cold regions research in over 80 papers. The South Pole Redevelopment Project section discusses the design and construction involved in the modernization and upgrade of facilities at the U.S. Amundsen-Scott South Pole Station. Design and construction problems in frozen ground and permafrost are addressed in the Frozen Ground Engineering section. The Environmental Engineering in Cold Regions section addresses water and wastewater systems, bioremediation, and contaminant analysis in cold regions. The use of satellite and airborne imagery for detection of oil spills and environmental degradation are discussed in the Remote Sensing Applications in Cold Regions section. The Cold Regions Transportation Issues section covers the solutions to problems affecting pavements, railroads, airfields, and snow-covered roads. The River Ice, Hydrology, and Hydraulics section addresses snowmelt, runoff, ice control, and modeling of ice-covered rivers. Structural and foundation problems are addressed in the Construction in Cold Regions section. The Atmospheric Icing section covers tree and power line damage due to freezing rain and ice storms. Finally, the Snow and Ice Engineering section looks at sea ice forces on structures and the effects of ice on riprap. The papers presented in this proceedings should provide a state-of-the-art look at cold regions engineering research and its application to realworld problems.

## 53-5122

**South Pole Station Redevelopment Project.**

Rand, J., Brier, F., MP 5386, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.1-10, 9 refs.

Stations, Site surveys, Cold weather construction, Buildings, Human factors engineering, Safety, Cost analysis, Antarctica—Amundsen-Scott Station

The National Science Foundation Office of Polar Programs, the lead agency for the U.S. Antarctic Program, has completed the design and started construction of a replacement station at the geographic South Pole, Antarctica. This paper provides a historical review of the concept development, design process and project management procedures for the South Pole Redevelopment Project.

## 53-5123

**Master plan for the South Pole Redevelopment Project.**

Ferraro, J.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.11-22, 1 ref.

Stations, Site surveys, Buildings, Cold weather construction, Antarctica—Amundsen-Scott Station

## 53-5124

**Environmental review in planning and design modernization of the Amundsen-Scott South Pole Station.**

Jatko, J.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.23-33, 4 refs.

Stations, Site surveys, Cold weather construction, Environmental impact, Environmental protection, Antarctica—Amundsen-Scott Station

## 53-5125

**Fire code compliance and life safety for the new South Pole Station.**

Janneck, T.W., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.34-44, 3 refs.

Stations, Buildings, Cold weather construction, Building codes, Fires, Warning systems, Safety, Countermeasures, Antarctica—Amundsen-Scott Station

## 53-5126

**Construction of the new South Pole Station.**

Marty, J.W., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.45-56, 9 refs.

Stations, Site surveys, Buildings, Cold weather construction, Logistics, Human factors engineering, Labor factors, Antarctica—Amundsen-Scott Station

## 53-5127

**Snowdrift design guidance for the new South Pole Station.**

Waechter, B.F., Williams, C.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.57-68, 6 refs.

Snowdrifts, Snow accumulation, Snow erosion, Snow loads, Stations, Buildings, Design criteria, Cold weather construction, Computerized simulation, Antarctica—Amundsen-Scott Station

## 53-5128

**Elevated station design for the South Pole Redevelopment Project at Amundsen-Scott South Pole Station.**

Brooks, W.D., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.69-81, 9 refs.

Snowdrifts, Snow accumulation, Snow loads, Snow erosion, Stations, Buildings, Supports, Cold weather construction, Design criteria, Antarctica—Amundsen-Scott Station

## 53-5129

**Foundation design for the elevated station at Amundsen-Scott South Pole Station.**

Berry, D.L., Braun, F.T., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.82-93, 2 refs.

Snowdrifts, Snow accumulation, Snow compression, Settlement (structural), Stations, Buildings, Foundations, Supports, Cold weather construction, Design criteria, Antarctica—Amundsen-Scott Station

## 53-5130

**Construction of unlined tunnels for icecap stations.**

Walsh, M.R., MP 5387, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.94-105, 12 refs.

Snow tunnels, Ice tunnels, Tunneling (excavation), Snow removal equipment, Ice cutting, Machinery, Construction equipment, Utilities, Antarctica—Amundsen-Scott Station

Facilities operations in a polar icecap environment present many unique challenges. Coping with the extreme cold temperatures, the darkness during the long winter months, and blowing and drifting snow all hamper installation, maintenance and repair operations. For over 40 years, the concept of using tunnels for utilities and personnel in polar environments has been tried with mixed results. In 1991, the U.S. Army Cold Regions Research and Engineering Laboratory initiated a project to develop, fabricate, test, build and deploy a system for the machining of unlined tunnels at the Amundsen-Scott South Pole Station. A system based on a modified tracked excavator was deployed to Antarctica in Jan. 1996 for testing. The system was modified and redeployed the following summer to create a subsurface utility. A 120 m long, 2-m by 3-m tunnel was machined into the firm at the station over the course of 10 days. The tunnel, at a maximum depth of 16 m, is currently being used for the main station's wastewater discharge line. At a near-constant -40°, the well-lit tunnel, secure from the elements, has already proven its worth during routine and emergency maintenance operations during the harsh polar winters since 1996. Further tunnels have been planned as part of the new U.S. South Pole Station.

## 53-5131

**Comparison of delivery scenarios for a long antarctic traverse.**

Blaisdell, G.L., MP 5388, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.106-117, 4 refs.

Logistics, Route surveys, Traverses, Snow roads, Tracked vehicles, Tractors, Cost analysis, Antarctica—McMurdo Station, Antarctica—Amundsen-Scott Station

A recently completed interdisciplinary study assessed the feasibility of a 1600 km oversnow trail connecting McMurdo Station to Amundsen-Scott South Pole Station. Aircraft (specialized ski-wheel Hercules or airdrop) are currently the only means of delivering large volumes of materials to the South Pole. In addition to personnel and their needs (food, scientific equipment, etc.), more than 1.1M liters of fuel are needed annually and 1.1M kg of construction supplies for station modernization are required annually for the next 8 years. This airlift seriously taxes the current US Antarctic Program's air resources during the 100-day South Pole flight season and constitutes a significant expense. Preliminary calculations suggested that a oversnow transportation system could provide considerable life-cycle cost savings. Results are reported elsewhere of the field study to determine feasible candidate routes and what driving conditions are likely to be encountered. This paper describes a) the process of determining the appropriate vehicle(s) for such a long, unsupported traverse, b) comparison of the two best candidate routes, and c) cal-

culations of roundtrip travel time, consumed fuel and deliverable payload. The latter statistics are compared to the current air delivery system and show the traverse to be twice as efficient, if speed of delivery isn't required.

## 53-5132

**South Pole Station new power plant case study.**

Ostberg, E., Posma, R., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.118-129, 6 refs.

Utilities, Electric power, Electric equipment, Heat recovery, Diesel engines, Fuels, Cold weather performance, Cost analysis, Antarctica—Amundsen-Scott Station

## 53-5133

**South Pole fuel storage: general arrangement issues.**

Kumin, J.P., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.130-139, 1 ref.

Logistics, Fuels, Oil storage, Storage tanks, Cold weather construction, Antarctica—Amundsen-Scott Station

## 53-5134

**Fuel storage system replacement, U.S. South Pole Station.**

Armstrong, R.S., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.140-147.

Utilities, Fuels, Oil storage, Storage tanks, Pipes (tubes), Pumps, Cold weather performance, Antarctica—Amundsen-Scott Station

## 53-5135

**Renewable energy field tests at the South Pole.**

Norton, G., Linton, E., Rand, J., Williams, C., MP 5389, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.148-159.

Utilities, Wind power generation, Solar radiation, Electric power, Electric equipment, Wind pressure, Cold weather tests, Cost analysis, Antarctica—Amundsen-Scott Station

The U.S. operates the Amundsen-Scott South Pole Station for scientific research. Due to the high costs, logistical constraints and environmental risks of transporting large quantities of diesel fuel to the antarctic interior, the National Science Foundation has supported practical investigations into the use of wind and solar energy to reduce the amount of fuel needed to meet the power requirements of the station. Following an introduction to the South Pole operating environment, this paper provides summaries of two recent field test projects. These projects evaluated the technical feasibility of deploying commercially available renewable energy hardware at the Pole, as a prelude to considering larger scale installations. One set of tests, performed by Northern Power Systems, involved installation and operation of a wind turbine at the Pole. The second project, carried out by the U.S. Army Cold Regions Research and Engineering Laboratory, included an operational evaluation of photovoltaic panels mounted on one of the structures of the Amundsen-Scott Station.

## 53-5136

**Retrospective on early analysis and simulation of freeze and thaw dynamics.**

Paynter, H.M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.160-172, 17 refs.

Soil freezing, Frozen ground thermodynamics, Freezing front, Frost penetration, Thaw depth, Stefan problem, Mathematical models, Computerized simulation

## 53-5137

**Creep behavior of frozen and unfrozen soils—a comparison.**

Ladanyi, B., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.173-186, 29 refs.

Clay soils, Soil freezing, Frozen ground thermodynamics, Frozen ground compression, Frozen ground strength, Soil tests, Soil strength, Soil creep, Strain tests, Mathematical models

## 53-5138

**Growth condition of ice lenses and applications.**

Nakano, Y., MP 5390, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.187-198, 40 refs.

Subgrade soils, Soil freezing, Frozen ground thermodynamics, Frozen ground strength, Freezing front, Soil water migration, Frost penetration, Ice lenses, Frost resistance, Frost protection, Thermal insulation, Soil stabilization, Mathematical models

As the 1990s arrived, there were many models of ice segregation, but they all suffered from the common fault of little or no experimental verification. Research efforts became focused on experimental evaluation of multiple hypotheses used in these models and significant progress was made toward quantitative understanding of ice segregation in the past decade. As knowledge advanced, research results became more mathematically oriented and less accessible to engineers. The objective of this paper is to present the current knowledge of ice lens growth with minimum number of equations and to explore practical ways to mitigate ice lens formation.

## 53-5139

**New simple frost model, validated and easy to use.**

Hermansson, A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.199-210, 12 refs.

Soil freezing, Frozen ground thermodynamics, Freezing front, Frost penetration, Frost heave, Subgrade soils, Soil tests, Freeze thaw tests, Freezing rate, Thawing rate, Road maintenance, Computer programs

## 53-5140

**Study of frozen cloddy soils properties as a road embankment material in permafrost regions.**

Grechishchev, S.E., et al, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.211-221, 7 refs.

Embankments, Subgrade soils, Permafrost beneath roads, Permafrost preservation, Frozen ground thermodynamics, Frozen ground strength, Ground thawing, Thaw weakening, Road maintenance, Mathematical models

## 53-5141

**Pile design in saline permafrost at Longyearbyen.**

Instanes, A., Instanes, D., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.222-231, 8 refs.

Buildings, Permafrost beneath structures, Saline soils, Frozen ground strength, Piles, Foundations, Pile load tests, Cold weather construction, Norway—Spitsbergen

53-5142

**Evaluation of helical piers in frozen ground.**

Liu, H., Zubeck, H., Baginski, S.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.232-242, 8 refs.

Piers, Foundations, Anchors, Frozen ground strength, Frozen ground compression, Soil creep, Design criteria, Mathematical models

53-5143

**Permafrost prethawing in farming, mining, and civil engineering.**

Nidowicz, B., Osterkamp, T.E., Shur, I.U.L., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.243-254, 14 refs.

Permafrost beneath structures, Permafrost beneath roads, Permafrost control, Ground thawing, Artificial freezing, Soil stabilization, Cold weather construction

53-5144

**Design and construction of water storage tanks on warm permafrost in rural Alaska.**

Schubert, D.H., Reitz, D.D., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.255-266, 10 refs.

Utilities, Water supply, Water storage, Storage tanks, Permafrost beneath structures, Permafrost preservation, Permafrost control, Soil freezing, Artificial freezing, Soil stabilization, Cost analysis, United States—Alaska

53-5145

**Mitigation options to reduce thaw instability hazard at the Denali Park Mile Post 45 landslide.**

Vinson, T.S., Thrall, F.G., Pfeiffer, T.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.267-278, 18 refs.

Permafrost beneath roads, Permafrost preservation, Slope stability, Frozen ground strength, Frozen ground settling, Thaw weakening, Soil stabilization, Landslides, Landslide control, Road maintenance, United States—Alaska—Denali National Park

53-5146

**Deformations of buildings in the cryolithozone.**

Grebenev, V.I., Il'ichev, V.A., Kerimov, A.G.O., Sadvoski, S.N., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.279-284, 6 refs.

Permafrost beneath structures, Foundations, Permafrost preservation, Soil freezing, Artificial freezing, Soil stabilization, Russia

53-5147

**Design and construction of arctic water distribution systems in rural Alaska.**

Reitz, D.D., Schubert, D.H., Wagner, D.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.285-296, 5 refs.

Utilities, Water supply, Water treatment, Water pipelines, Sanitary engineering, Sewage disposal, Cold weather construction, Cost analysis, United States—Alaska

53-5148

**Water and wastewater systems in rural Alaska: status, needs and trends.**

Schubert, D.H., Reitz, D.D., Wagner, D.J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.297-308, 9 refs.

Utilities, Water supply, Water treatment, Water pipelines, Sanitary engineering, Sewage disposal, Health, Cold weather operation, Cost analysis, United States—Alaska

53-5149

**Effect of dissolved solids on freeze-thaw conditioning.**

Martel, C.J., MP 5391, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.309-316, 9 refs.

Sludges, Water treatment, Waste treatment, Sewage disposal, Sanitary engineering, Artificial freezing, Freeze drying, Ice crystal growth, Ice crystal structure

The purpose of this study was to investigate the effect of dissolved solids on the size of aggregated particles produced by freeze-thaw conditioning of alum sludge. The dissolved solids content was varied by adding 0-2000 mg/L NaCl to samples of alum sludge. The effect of the dissolved solids was observed by taking photographs of thin sections of each frozen sample and measuring the resulting aggregated particle sizes. The results of this study indicate that a relatively small amount of dissolved solids (500 mg/L NaCl or less) will cause ice crystal growth to change from columnar to dendritic. As a result, the mean aggregated particle size was reduced by approximately 50%. These results explain why the aggregated particles from alum sludge are large and easier to dewater than those produced from wastewater sludge. Generally, alum sludge contains very little dissolved-solids, so crystal growth is columnar. Conversely, wastewater sludges usually contain a significant amount of dissolved solids so that crystal growth becomes dendritic. Thin sections photographed between cross polarizers reveal that most of the aggregated particles were trapped within individual ice crystals and not at the crystal boundaries.

53-5150

**Sewage sludge management at Eielson AFB, Alaska.**

Stankoff, R., White, D.M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.317-328, 18 refs.

Military facilities, Utilities, Sanitary engineering, Water treatment, Waste treatment, Sludges, Sewage disposal, Earth fills, Cold weather operation, Cost analysis, United States—Alaska—Eielson Air Force Base

53-5151

**Radio frequency heating system for enhanced bioremediation: pilot test results, Fort Wainwright, Alaska.**

Marley, M.C., et al, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.329-340, 20 refs.

Military facilities, Oil spills, Soil pollution, Waste disposal, Soil microbiology, Soil temperature, Radio waves, Radiant heating, Land reclamation, United States—Alaska—Fort Wainwright

53-5152

**Tanker rollover and potential consequences from burning fuels on arctic tundra.**

Filler, D.M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.341-351, 10 refs.

Tank trucks, Accidents, Oil spills, Tundra soils, Soil pollution, Water pollution, Waste disposal, Fires, Land reclamation, United States—Alaska—North Slope

53-5153

**Contaminant analysis in tundra by pyrolysis-GC/FID.**

Garland, D.S., White, D.M., Woolard, C.R., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.352-362, 6 refs.

Oil spills, Tundra soils, Soil pollution, Frozen ground chemistry, Soil chemistry, Soil analysis, Chemical analysis, United States—Alaska—North Slope

53-5154

**Remote sensing and GIS for oil contamination of frozen terrain application.**

Marchand, Y., Rees, W.G., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.363-373, 20 refs.

Oil spills, Soil pollution, Tundra soils, Forest soils, Permafrost preservation, Frozen ground chemistry, Terrain identification, Spaceborne photography

53-5155

**Oil spill detection in the Norwegian Sea using spaceborne SAR imagery.**

Litovchenko, K., Ivanov, A.I.U., Ermakov, S.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.374-383, 14 refs.

Oil spills, Water pollution, Radar tracking, Synthetic aperture radar, Spaceborne photography, Image processing, Norwegian Sea

53-5156

**Airborne images in the cryolithozone monitoring.**

Mudrov, I.U.V., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.384-393, 4 refs.

Tundra soils, Forest soils, Soil pollution, Soil erosion, Thermokarst, Human factors, Environmental impact, Permafrost preservation, Land reclamation, Terrain identification, Aerial surveys, Spaceborne photography, Image processing, Russia

53-5157

**Constructability of polymer-modified asphalt aggregate mixtures in Alaska.**

Zubeck, H., Raad, L., Saboundjian, S., Minassian, G., Ryer, J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.394-405, 5 refs.

Pavements, Bitumens, Polymers, Concrete admixtures, Concrete aggregates, Cold weather tests, Road maintenance, United States—Alaska

53-5158

**Polymer-modified asphalts in cold regions-user survey.**

Zubeck, H., Raad, L., Ryer, J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.406-415, 1 ref.

Pavements, Bitumens, Polymers, Cold stress, Cold weather tests, Road maintenance



## 53-5159

**Fighting frost problems in New York State pavements.**

Burnett, R.A., Dwyer, D.F., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.416-427, 13 refs.

Pavements, Subgrade soils, Frost penetration, Frost action, Frost heave, Frost resistance, Frost protection, Road maintenance, Cost analysis, United States—New York

## 53-5160

**Field trial of tire shreds as insulation for paved roads.**

Lawrence, B.K., Humphrey, D.N., Chen, L.H., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.428-439, 8 refs.

Pavements, Subgrade soils, Tires, Waste disposal, Thermal insulation, Frost penetration, Frost protection, Road maintenance, United States—Maine

## 53-5161

**Rehabilitation of Route 15 in Big Squaw, Maine.**

Dunn, P., Jr., Colson, S., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.440-451, 3 refs.

Pavements, Subgrade soils, Aggregates, Gravel, Geotextiles, Soil stabilization, Subgrade maintenance, Road maintenance, Bearing tests, Trafficability, Cost analysis, United States—Maine

## 53-5162

**SERUL: a unique research facility for low volume roads in frost conditions.**

Doré, G., LeBel, L., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.452-460, 3 refs.

Research projects, Laboratories, Pavements, Frost action, Frost protection, Road maintenance, Environmental tests, Cold weather tests, Canada—Quebec

## 53-5163

**Reducing damage to low volume asphalt-surfaced roads, and improving local economies: update on variable tire pressure project.**

Kestler, M.A., Nam, S.I., MP 5392, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.461-471, 13 refs.

Pavements, Thaw weakening, Tires, Highway planning, Road maintenance, Cold weather operation, Environmental tests, Computerized simulation

Spring thaw adversely affects both pavement life and local economies throughout the northern United States and Canada. Each year significant damage is done to bituminous-surfaced low volume roads from trafficking during thaw-weakened periods. To prevent higher maintenance and reconstruction costs, many road agencies impose load restrictions limiting loads or closing low volume roads to trucks during these damage-susceptible periods. Companies whose livelihood depends on trucking can suffer economic losses while waiting for thawing roads to recover, and for load restriction signs to be removed. A group of concerned federal agencies, departments of transportation, and private companies throughout the United States and Canada has organized an effort to verify computer simulations that suggest using reduced tire pressures on thaw-weakened asphalt-surfaced low volume roads can reduce pavement damage. Full-scale tests using a heavy vehicle simulator are underway at the U.S. Army Cold Regions Research and Engineering Laboratory in Hanover, NH, in which a variety of tire pressures are being applied to several pavement test sections subjected to thawing. In addition to reducing road maintenance costs and extending pavement life, the pooled-fund test program discussed in this paper has the potential to affect current guidelines that restrict hauling, thereby extending the haul season in the springtime.

## 53-5164

**Large aircraft operations at small airports: when can heavier-than-design aircraft use thin frozen pavements.**

Kestler, M.A., Cortez, E.R., Berg, R.L., MP 5393, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.472-486, 13 refs.

Runways, Pavements, Subgrade soils, Soil freezing, Freezing indexes, Frost penetration, Frost resistance, Thaw depth, Frozen ground strength, Bearing tests, Trafficability, Computerized simulation, United States—North Dakota—Williston

In response to a request by airport officials in Williston, ND, to allow heavier-than-design aircraft to operate at Sloulin Field on frozen runway pavements during winter months, the Federal Aviation Association contacted the U.S. Army Cold Regions Research and Engineering Laboratory, and a research project was implemented. Instrumentation was installed at Sloulin Field during Oct. 1992, and subsurface temperature, soil moisture content, and pavement stiffness were monitored for the following four years. Using these data, the development of a simple index (based upon frost or thaw depths, freeze-thaw cycles, and other environmental factors) that can be used to roughly estimate pavement strength was investigated. Additionally, a thaw prediction model was developed. The computer program provides recommendations on whether a plane can land on the runway or park on the apron during the ensuing five days without causing unacceptable pavement damage. Although the frozen pavement at Sloulin Field can support heavier-than-design aircraft, it still may not be able to support the level of increase that some pavements could because the pavement modulus is so variable spatially and the subsurface structure at Sloulin Field tends to be quite dry (lowering the potential increase in modulus upon freezing). Consequently, the heavier-than-design aircraft considered in this study refers to aircraft in the 74,000-80,000 lb range with characteristics similar to those of the BAE 146-100. This report outlines the background, describes the test program and provides simple guidelines for (and limitations on) computer program use. Investigations leading to the development of a lookup table based on easy-to-measure environmental parameters will be discussed separately. The prediction model is site-specific to Sloulin Field. However, techniques similar to those used provide a valuable tool from which other site-specific or general models can be readily developed.

## 53-5165

**Roughness wavelengths induced by frost heave.**

Lenngren, C.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.487-498, 4 refs.

Runways, Pavements, Frost heave, Surface roughness, Lidar, Sweden

## 53-5166

**Ice/frost heave prevention system aided by heat pipe for railway tunnel.**

Fujii, T., Kajiyama, H., Iikura, S., Okada, K., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.499-509, 4 refs.

Railroad tunnels, Linings, Icicles, Ice prevention, Frost heave, Frost protection, Thermal insulation, Heat pipes, Heat transfer, Mathematical models, Japan

## 53-5167

**Concept of ensuring the serviceability of the roadbed of the Berkakit-Tommot-Yakutsk Railway on sections of very icy permafrost.**

Kondrat'ev, V.G., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.510-518, 14 refs.

Railroads, Roadbeds, Embankments, Subgrade soils, Ground ice, Thaw weakening, Permafrost beneath roads, Permafrost preservation, Snowsheds, Frost protection, Soil stabilization, Subgrade maintenance, Road maintenance, Russia—Yakutia, Baykal Amur Railroad

## 53-5168

**Finite element analysis of a wheel rolling in snow.**

Shoop, S.A., Haehnel, R.B., Kestler, K., Stebbings, K., Alger, R., MP 5394, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.519-530, 13 refs.

Vehicle wheels, Tires, Traction, Rubber snow friction, Snow density, Snow hardness, Snow strength, Snow deformation, Environmental tests, Computerized simulation

A three-dimensional model of a wheel moving through snow was generated using commercial finite element software (ABAQUS). Because of the large deformation of the snow relative to the tire, a rigid wheel was used to simplify computations. The snow was modeled as both an elastic-plastic material and as a crushable foam material. Models of uniaxial compression and plate sinkage tests in snow were used to explore the snow material model and match measured and observed snow deformation to model results. These constitutive models were then applied to the three-dimensional tire-snow model. New Arbitrary Lagrangian-Eulerian adaptive meshing formulations were also evaluated for improvements in handling the large deformations encountered in tire-snow interactions. Modeled snow deformation is compared to sinkage, displacement, and changes in snow densities. The modeled reaction forces on the wheel are compared with tire forces measured using the CRREL Instrumented Vehicle.

## 53-5169

**Putting snow research into practice for better snowmobile trails and ski slopes.**

Wuori, A.F., Alger, R., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.531-537, 9 refs.

Snow vehicles, Snow roads, Snow compaction, Snow stabilization, Snow strength, Snow density, Snow hardness

## 53-5170

**Distributed Snow Process Model for use with HEC-HMS.**

Daly, S.F., Ochs, E.S., Brooks, P.F., Pangburn, T., Davis, E.M., MP 5395, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.538-549, 6 refs.

Watersheds, Snow hydrology, Snow water equivalent, Snowmelt, Runoff forecasting, Computer programs

The Distributed Snow Process Model (DSPM) is a new approach to estimating runoff from snowmelt. The DSPM estimates the snowmelt in an area defined by a Standard Hydrologic Grid (SHG) using the SSARR\_grid snow process model. A watershed can contain many separate SHG cells, depending on the size of the watershed and the size of the SHG selected. The SSARR\_grid snow process model evaluates the snowmelt in each grid cell on the basis of the snow condition, elevation, temperature, and precipitation for that grid cell and the watershed properties. The snow conditions in each grid cell—snow melt, snow water equivalent, liquid water content, cold content, antecedent temperature index, and the antecedent melt index—are stored each time step in a gridded HEC-DSS database. The DSPM is a stand-alone program that provides input data to the Hydrologic Engineering Center's Hydrologic Modeling System through the gridded database. Sample results are included to demonstrate the type and range of output available from the DSPM.

## 53-5171

**Diurnal variation in dissolved oxygen measurements during late winter ice-covered period, Sleeper's River, Vermont.**

White, K.D., Melloh, R.A., MP 5396, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.550-560, 22 refs.

River ice, Ice cover effect, Ice water interface, Oxygen, Aeration, Water chemistry, Photosynthesis, Plant physiology, Plant ecology, Microbiology, Biomass, Diurnal variations, United States—Vermont

Dissolved oxygen, a critical element in riverine systems, is required to support aquatic life and maintain good water quality. Previous research has documented the occurrence of oxygen depressions in ice-covered rivers that coincide with ice cover formation. These oxygen sags have been attributed to lack of reaeration because of the ice cover, oxidation of organic material, and inputs of oxygen-depleted groundwater. Diurnal variations in dissolved oxygen are

key to understanding the oxygen balance processes of a stream, and previous studies provide only limited data in this regard. The present study incorporates continuous, high-temporal-resolution sub-ice water quality data and photosynthetically active radiation data for a gaged site in the Sleeper's River Research Watershed, VT. The first winter's observations, collected during late winter through spring breakup, are presented here. These data describe in detail the in-stream water quality environment during spring breakup and reveal a pronounced diurnal cycling of dissolved oxygen in the period just prior to breakup that appears to be the result of biological processes.

### 53-5172

#### Breakup on the upper St. John River.

Zufelt, J.E., MP 5397, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.561-575, 5 refs.

River ice, Ice breakup, Ice jams, Ice forecasting, Flood forecasting, Warning systems, United States—Maine—Saint John River

The Upper St. John River flows through primarily uninhabited forestlands in northwest Maine. Its dynamic ice breakup results in annual ice jams and flooding at many locations along this reach of the river. Dickey, ME, is the most upstream community on the St. John River and, therefore, does not receive warning from upstream communities that an ice run has begun or that there is potential of damaging ice jams and flooding. In Apr. 1991, a severe ice run and jam at Dickey caught residents unprepared, with many residents being stranded as ice and water surrounded their homes, destroying the only bridge across the St. John River for 100 km. The communities downstream receive some warning that an ice run or jam has occurred in Dickey and is on its way downstream, although the warning time may be minimal. A properly placed sensor upstream of Dickey could give an early warning to residents that breakup has begun and ice jamming might occur. This paper describes experiments to track the ice breakup along the St. John River upstream of Dickey and how this information might be used to provide early warning of ice runs or jams at Dickey and communities downstream.

### 53-5173

#### Kuparuk River submersible bridges and roadways.

Christopherson, A.B., Braun, K.W., Thieman, D.S., Carn, S.L., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.576-587, 5 refs.

River crossings, Floodplains, Bridges, River ice, Ice breakup, Ice control, Flood control, United States—Alaska—Kuparuk River

### 53-5174

#### Loose-bed issues in river-ice hydraulics.

Ettema, R., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.588-599, 11 refs.

River ice, Ice cover effect, Ice water interface, River flow, Water erosion, Alluvium, Suspended sediments, Bottom sediment, Sediment transport, Flow control, Channel stabilization, Mathematical models

### 53-5175

#### Abutment scour at small, severely contracted bridges.

Niezgodna, S.L., Johnson, P.A., MP 5398, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.600-611, 13 refs.

River flow, Floodplains, Bridges, Piers, Foundations, Water erosion, Computer programs

Abutment scour at small, severely contracted bridges is not specifically addressed in current scour guidelines. Many of the abutments at these bridges are vertical and set along the main channel banks. The long roadway approach section and narrow bridge opening force floodplain waters to re-enter the main channel at the bridge, causing a severe contraction in flow area that results in both contraction and local scour. Current scour guidelines assume that contraction and local scour processes are independent and are determined separately and summed for a total scour depth. Because of the severe contraction in flow area, independent scour processes cannot be assumed. Thus, the practice of assuming independence may result in significant over-estimations of scour depth at severely contracted bridges. In this study, a relatively new scour model, ABCSCOUR, is tested to determine its ability to provide more realistic scour estimates at severely contracted bridges by accounting for flow non-uniformity in

a single total scour equation. The program format is also examined to determine its applicability to a wide range of environments. The results showed that scour depth predictions at prototype bridges were excellent, and that program applicability to a variety of environmental conditions was promising.

### 53-5176

#### Modeling river ice using discrete particle simulation.

Daly, S.F., Hopkins, M.A., MP 5399, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.612-622, 13 refs.

River ice, Ice jams, Ice water interface, River flow, Hydraulic structures, Piers, Flow control, Ice control, Ice models, Mathematical models

Recent advances in discrete element modeling now allow the direct simulation of river ice dynamics. By resolving the contact and body forces acting on thousands of individual floes at each time step, the initiation, grounding, and formation of river ice jams can be simulated and studied. The attendant water flow is modeled using a coupled unsteady hydraulic model, with feedback provided between floes and water by water drag and blockage of the channel flow area by ice. The regimes of water flow that are modeled include open-channel flow area by ice. The regimes of water flow that are modeled include open-channel flow with no ice, flow under moving or stationary ice, and high-Reynolds-number porous flow through grounded and floating ice masses. The use of variable channel geometry, which allows realistic channel sections to be modeled, is described here. Results are presented for a simulation of the arrest of a large ice run by an ice-control structure consisting of nine evenly spaced, cylindrical piers. Discrete element simulation promises to be an important tool in the design and implementation of ice-control measures.

### 53-5177

#### Soo Locks ice problems and possible solutions.

Tuthill, A.M., MP 5400, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.623-630, 3 refs.

Locks (waterways), River ice, Ice navigation, Ice control, Ice passing, Bubbling, United States—Michigan—St. Marys River

The Soo Locks at Sault Ste. Marie, MI allow passage of deep draft vessels from Lake Superior to the lower Great Lakes and St. Lawrence River system. Although the locks are closed to winter-long navigation, operators face serious ice problems following the reopening of the locks in early spring. Broken lake ice pushed ahead of downbound ships can make it difficult or impossible for the vessels to enter the locks. Existing solutions such as locking the ice separately through the main lock or an adjacent smaller lock result in delays and increased costs to the navigation industry. A physical model study at the Cold Regions Research and Engineering Laboratory will examine a range of alternatives aimed at improving ice passage at the Soo Locks. This paper describes the ice problems at the Soo as well as the objectives of the physical model study.

### 53-5178

#### Low-cost ice control structures for small rivers.

Lever, J.H., Gooch, G.E., MP 5401, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.631-640, 17 refs.

River ice, Freezeup, Ice breakup, Ice jams, Ice control, Flood control, Hydraulic structures, Cost analysis

Control of ice jams on small rivers must balance the competing requirements of low cost and reliable performance. Using a refrigerated hydraulic laboratory, the authors have developed three new low-cost structures that should meet these requirements. One is a seasonally installed "tension weir" that creates a small pool to promote early ice-cover formation and consequently reduces freezeup ice jams downstream. It performed well during four seasons of field trials. The other two structures, consisting of a few large elements spaced across a river adjacent to a natural floodplain, control breakup ice jams. A breakup structure consisting of four massive sloped blocks has performed well since its construction in Hardwick, VT, in 1994. Based on model tests, a similar structure consisting of cylindrical piers should provide greater ice-restraining capacity, albeit at higher cost.

### 53-5179

#### Effects of holes drilled in a river ice cover on the heat transfer at the ice/water interface.

Haehnel, R.B., Clark, C.H., Daly, S.F., MP 5402, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.641-652, 11 refs.

River ice, Ice jams, Ice cutting, Ice drills, Ice water interface, Ice heat flux, Heat transfer, Artificial melting, Ice breaking, Ice control, Flood control, Mathematical models, United States—Wisconsin—Oconto River

Drilling holes in a river ice cover has been used on the Oconto River to reduce ice jam flooding in the city of Oconto, WI, since the spring of 1988. Though this technique appears to have been successful at preventing ice jam flooding, it is not clear what physical processes are responsible for its success. This study explores the effects of the holes on enhancing the turbulent heat transfer at the ice/water interface, thereby advancing the deterioration of the ice cover. The heat transfer coefficient between a flat ice sheet (with and without holes) and flowing water was measured in the refrigerated flume facility at CRREL. The results show no change in the bulk Nusselt number due to the presence of the holes in the ice sheet. However, the local Nusselt number (measured in the vicinity of the holes) was initially much higher than the bulk number, but decays with time as local melting streamlines the hole. This local modification of the heat transfer has the effect of accelerating the melting of the ice in the region surrounding the hole, streamlining the hole. This work suggests that the reduction in ice volume caused by this effect is negligible in comparison to the total ice volume in the river, and likely has no effect on reducing ice jam potential.

### 53-5180

#### From Antarctica to Mars.

Thulin, F.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.653-664, 3 refs.

Mars (planet), Stations, Buildings, Steel structures, Masonry, Human factors engineering, Cold weather construction, Cold weather survival, Antarctica

### 53-5181

#### Measurement of the pore size distribution of geomaterials using conductometric phase transition porosimetry.

Gunnink, B.W., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.665-676, 9 refs.

Soil structure, Cellular concretes, Porous materials, Porosity, Capillarity, Supercooling, Liquid solid interfaces, Interstitial ice, Freezing points, Phase transformations

### 53-5182

#### Effects of low temperature on concrete strength.

Korhonen, C.J., Orchino, S.A., MP 5403, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.677-683, 7 refs.

Concrete freezing, Winter concreting, Concrete curing, Concrete hardening, Concrete strength, Temperature effects, Low temperature tests, Frost resistance, Frost protection

Temperature affects the way concrete gains strength. High temperatures tend to accelerate early age strengths but decrease later strengths, while low temperatures retard early age strengths and increase later strengths. It is well known that freezing concrete at an early age can result in permanent damage. What is not well known or appreciated is that concrete can benefit from the cold. Cold weather often results in concrete of superior strength, compared to concrete cast during warm weather, and if fresh concrete is frozen at an early age, it can recover full potential strength when thawed. The problems as well as the opportunities of low temperature concreting are discussed.

**53-5183****Frost heave problems inside a nuclear power plant.**

Korhonen, C.J., Hughes, J., MP 5404, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.684-691, 1 ref.

Nuclear power, Floors, Concrete slabs, Frost heave, Ice lenses, Thermal insulation, Artificial freezing, Artificial thawing, Drainage, Drains, Pumps, Frost protection

The ice condenser floors of a nuclear power plant had heaved upward and were binding against steam-vent doors. By drilling wells into the floors, insulating them, and thawing the ice beneath them, a large amount of water was pumped from the insulation beneath the floors. As a result, they dropped and created needed floor-to-door clearance. Although the partially dewatered floors are heaving again, they should not rise enough to become the problems they once were. In addition, the wells are in place for periodic dewatering should the need arise.

**53-5184****Rain-on-snow surcharge for roof design.**

O'Rourke, M., Downey, C., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.692-703, 10 refs.

Roofs, Rain, Snow loads, Building codes, Statistical analysis

**53-5185****Strengthening of structures of a mine in the north.**

Grebenets, V.I., Kerimov, A.G.O., Titkov, S.N., Shilov, S., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.704-709, 2 refs.

Mining, Buildings, Foundations, Permafrost beneath structures, Permafrost control, Thaw weakening, Frozen ground settling, Settlement (structural), Frost protection, Cold weather construction, Russia—Noril'sk

**53-5186****Rigid insulation to reduce foundation embedment.**

Recker, K.L., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.710-716, 4 refs.

Liquefied gases, Storage tanks, Foundations, Settlement (structural), Subgrade soils, Earth fills, Thermal insulation, Frost protection, Soil stabilization, United States—Maine

**53-5187****Installation and evaluation of driven steel pipe piles in Alaska soils.**

Merrill, K.S., Korri, K., Miner, R.F., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.717-730, 8 refs.

Piles, Steel structures, Pipes (tubes), Foundations, Permafrost beneath structures, Soil strength, Frozen ground strength, Pile driving, Pile load tests, United States—Alaska

**53-5188****Helical piling foundations in Juneau, Alaska.**

Johnston, R.J., Swanston, D.N., Baxandall, F.W., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.731-736, 5 refs.

Residential buildings, Piles, Foundations, Anchors, Permafrost beneath structures, Permafrost control, Frozen ground strength, Cold weather construction, United States—Alaska—Juneau

**53-5189****Development of design and construction techniques for deep foundations of large bridges: the Russian experience.**

Likverman, A.I., Seliverstov, V.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.737-746, 6 refs.

Bridges, Piers, Foundations, Building codes, Frost protection, River ice, Ice control, Cold weather construction, Russia

**53-5190****Specific features of design and analysis of cable-stayed bridge over River Ob in western Siberia (Russia).**

Surovtsev, V.P., Baraboshin, O.V., Odintsov, V.V., Seliverstov, V.A., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.747-756, 6 refs.

Bridges, Cables (ropes), Steel structures, Frost resistance, Building codes, Cold weather construction, Russia—Ob' River, Russia—Surgut

**53-5191****Ice storms, trees and power lines.**

Jones, K.F., MP 5405, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.757-767, 9 refs.

Ice storms, Power line icing, Ice accretion, Ice loads, Ice forecasting, Trees (plants), Mathematical models, United States

Ice storms can cause prolonged outages in the supply of electric power to residents and industry. As the authors have become more dependent on electric power for lighting, heat, water, and communications, disruptions in the power supply have more severe consequences. This paper reviews a simple ice accretion model for forecasting ice loads in freezing-rain storms. Then, starting from information on the distribution of branch and twig diameters, the relative weights of ice on trees and on wires are compared. Finally, the areas of severe ice storms that have occurred in the southeastern United States are used to show the frequency of ice storms of large and small extents in that region. Utilities can use this kind of information to evaluate their ability to respond to damaging ice storms.

**53-5192****Tree damage to electric utility infrastructure assessing and managing the risk from storms.**

Simpson, P.O., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.768-778, 10 refs.

Utilities, Ice storms, Snowstorms, Trees (plants), Ice loads, Snow loads, Wind pressure, Vegetation factors, Damage, Cost analysis

**53-5193****Reliability analysis of electric distribution systems.**

Chouinard, L.E., Fortier, D., Taras, A., Iordanescu, M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.779-789, 5 refs.

Utilities, Ice storms, Power line supports, Power line icing, Ice accretion, Ice loads, Wind pressure, Statistical analysis, Canada—Quebec

**53-5194****Ice and the wire systems of a transmission line.**

White, H.B., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.790-798, 6 refs.

Ice storms, Supercooled clouds, Power line icing, Ice accretion, Ice loads, Design criteria

**53-5195****Galloping of ice covered wires of a transmission line.**

White, H.B., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.799-804, 8 refs.

Power line icing, Ice accretion, Ice loads, Wind pressure, Damping

**53-5196****Innovative airborne inventory and inspection technology for electric power line condition assessments in remote areas and cold climates.**

Ostendorf, M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.805-811, 2 refs.

Utilities, Power lines, Power line supports, Power line icing, Damage, Aerial surveys

**53-5197****Extreme event loading and cascading failure risk assessment for electric power lines.**

Ostendorf, M., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.812-823, 4 refs.

Power line icing, Power line supports, Ice loads, Wind pressure, Structural analysis, Statistical analysis, Mathematical models, Design criteria

**53-5198****Ice effects on riprap: model tests.**

Sodhi, D.S., Donnelly, C.J., MP 5406, International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.824-837, 9 refs.

River ice, Bank protection (waterways), Rock fills, Ice erosion, Ice push, Ice pileup, Ice override, Ice loads, Ice pressure, Ice friction, Ice control, Channel stabilization, Environmental tests

The authors conducted 50 model tests to simulate the ice action on a riprap-protected bank and to determine the riprap damage caused during the interaction. The tests were conducted with the model riprap banks in different orientations relative to the direction of ice motion, at three different slopes, with two mixes of riprap stones, and with model ice sheets of different thicknesses. Because the tests used two model riprap banks with different stone sizes in the experiment setup, data for two ratios of ice thickness to median stone size were obtained from each test. The data on riprap damage is presented in tabular and graphical forms. The authors give plots of cumulative probability and a damage parameter for riprap failure with respect to the ratio of ice thickness to median stone size. The results indicate that riprap failure takes place when ice thickness is equal to, or thicker than, the median stone size. Accepting some (15%) probability of riprap failure, the authors find that the median stone size needs to be 2-3 times the ice thickness to protect a bank from an ice action.

**53-5199****Analysis of ice forces on small conical structures.**

Braun, K.W., Liu, H., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.838-849, 7 refs.

Offshore structures, Ice solid interface, Ice cover strength, Ice loads, Ice pressure, Ice friction, Ice deformation, Ice breaking, Computer programs

**53-5200****First two platforms with suction pile foundations subjected to sea ice forces in the Bohai Sea.**

Liu, L.M., Ding, H.Y., Qi, L., Wang, J.Y., Xu, J.Z., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.850-857, 2 refs.

Offshore structures, Ice loads, Ice pressure, Ice friction, Ice control, Design criteria, China—Bohai Sea

## 53-5201

**Analyses of ice-induced vibration and estimation of soil softening under vibration of a suction foundation platform.**

Qi, L., Ding, H.Y., Du, X.Z., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.858-866, 10 refs.

Offshore structures, Foundations, Ice solid interface, Ice loads, Ice pressure, Ice friction, Bottom sediment, Soil strength, Soil creep, Dynamic loads, Design criteria, Mathematical models, China—Bohai Sea

## 53-5202

**Generalized integral laws of frost heaving soils: their development and use in design of structures and aerodromes.**

Golli, O.R., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.867-881, 10 refs.

Foundations, Subgrade soils, Permafrost beneath structures, Permafrost control, Permafrost preservation, Soil freezing, Frozen ground strength, Frozen ground compression, Frost heave, Frost resistance, Mathematical models, Cold weather construction

## 53-5203

**Structural analysis: Kachemak River culverts.**

Christopherson, A.B., Liu, H., Sawhill, J., International Conference on Cold Regions Engineering, 10th, Lincoln, NH, Aug. 16-19, 1999. Proceedings. Putting research into practice. Edited by J.E. Zufelt, Reston, VA, American Society of Civil Engineers (ASCE), 1999, p.882-893, 2 refs.

Road maintenance, Earth fills, Pipes (tubes), Drains, Culverts, Thaw weakening, Settlement (structural), Cold weather construction, Structural analysis, Computerized simulation, United States—Alaska—North Slope

## 53-5204

**Innocents on the ice: a memoir of Antarctic exploration, 1957.**

Behrendt, J.C., Niwot, CO, University Press of Colorado, 1998, 428p.

DLC G850.B44 1998

Expeditions, History, Antarctica

## 53-5205

**Atlas of antarctic sea ice and icebergs.**

Romanov, A.A., Fair Lawn, NJ, Backbone Publishing Company, 1999, 175p., 48 refs.

Sea ice, Icebergs, Maps, Sea ice distribution, Ice navigation, Classifications, Polynyas, Ice floes, Drift, Ice cover thickness, Icebreakers, Marine transportation, Fast ice, Ice cover strength, Ship icing, Pressure ridges, Antarctica

## 53-5206

**Electric and elastic properties of frozen earth materials. [Elektricheskie i uprugie svoystva merzlykh porod i t.dov]**

Frolov, A.D., Pushchino, ONTI PNTs RAN, 1998, 514p., In Russian with summary, title page, and table of contents in English. 300 refs.

Ice elasticity, Ice electrical properties, Cryogenic structures, Phase transformations, Liquid phases, Ice acoustics, Elastic properties, Snow elasticity, Snow electrical properties, Electrical properties, Frozen rocks, Frozen ground physics, Frozen ground mechanics, Electromagnetic properties, Wave propagation, Snow acoustics, Acoustics

## 53-5207

**Hoodoo '97 Expedition: probing the ice cap of Hoodoo Mountain volcano, Iskut River region, British Columbia.**

Russell, J.K., Stasiuk, M.V., Hickson, C.J., Maxwell, M., Edwards, B.R., Canada. *Geological Survey. Current research. Part A*, 1998, No.1998-A, p.49-54, With French Summary. 23 refs.

DLC QE48.C2 1998 Pts A+B

Volcanoes, Mountain glaciers, Cirque glaciers, Glacier surveys, Glacier thickness, Topographic surveys, Subglacial observations, Bottom topography, Radio echo soundings, Electromagnetic prospecting, Volcanic ash, Ice dating, Flood forecasting, Canada—British Columbia—Coast Mountains

## 53-5208

**Ice cap of Hoodoo Mountain volcano, northwestern British Columbia: estimates of shape and thickness from surface radar surveys.**

Russell, J.K., et al, Canada. *Geological Survey. Current research. Part A*, 1998, No.1998-A, p.55-63, With French Summary. 28 refs.

DLC QE48.C2 1998 Pts A+B

Volcanoes, Mountain glaciers, Cirque glaciers, Glacier surveys, Glacier thickness, Ice volume, Topographic surveys, Subglacial observations, Bottom topography, Radio echo soundings, Electromagnetic prospecting, Canada—British Columbia—Coast Mountains

## 53-5209

**Global Positioning System survey of ground-penetrating radar traverses of the ice cap, Hoodoo Mountain, British Columbia.**

Nicholls, J., Page, T., Schmok, J., Russell, J.K., Stasiuk, M.V., Canada. *Geological Survey. Current research. Part A*, 1998, No.1998-A, p.65-68, With French Summary.

DLC QE48.C2 1998 Pts A+B

Volcanoes, Mountain glaciers, Cirque glaciers, Glacier surveys, Geodetic surveys, Topographic surveys, Radio echo soundings, Electromagnetic prospecting, Canada—British Columbia—Coast Mountains

## 53-5210

**Evidence of catastrophic rock avalanche potential and past failures, east face of Mount Livingstone and Windsor Ridge, Alberta.**

Jackson, L.E., Jr., Lebel, D., Canada. *Geological Survey. Current research. Part A*, 1998, No.1998-A, p.225-231, With French Summary. 12 refs.

DLC QE48.C2 1998 Pts A+B

Slope stability, Landslides, Mass movements (geology), Avalanche forecasting, Canada—Alberta—Rocky Mountains

## 53-5211

**Analysis of the thermal field to determine constraints on gas hydrate stability in Yukon Territory and western Northwest Territories.**

Smith, S.L., Canada. *Geological Survey. Current research. Part B*, 1998, No.1998-B, p.235-241, With French Summary. 27 refs.

DLC QE48.C2 1998 Pts A+B

Natural gas, Hydrates, Exploration, Permafrost surveys, Permafrost depth, Permafrost thickness, Permafrost thermal properties, Well logging, Canada—Yukon Territory, Canada—Northwest Territories

## 53-5212

**Infrared thermography for condition assessment of buried district heating piping.**

Phetteplace, G., MP 5407, American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). *Transactions*, 1999, 105(pt.2), 6p., 13 refs.

Utilities, Heating, Heat transmission, Heat pipes, Underground pipelines, Heat loss, Soil temperature, Infrared photography

Infrared thermography has been used successfully for many years to find problem areas on buried district heating systems. While such information is useful for locating areas of major failures, for planning purposes some quantification of the results from an infrared survey of major portions of a district heating system would be advantageous. Some recent progress has been made toward this end by two International Energy Agency District Heating projects in which the U.S. Army Cold Regions Research and Engineering Laboratory (CRREL) has participated with colleagues from the Nordic countries. The objective of these projects was to develop a method

that would allow quantification of heat losses from the temperature profile of the ground's surface above the buried heat distribution pipeline. Basically, the method uses the integral of the temperature distribution at the ground's surface along with climatological and system data to arrive at an empirical estimate of the heat loss. Using this method, CRREL has conducted infrared surveys of two facilities. Results have been good, and the facilities have been provided with both heat loss estimates and prioritized replacement lists. This paper describes the "TX method," as it is called, and its use. Sample results from the surveys done to date will also be presented.

## 53-5213

**Ice events in the Susquehanna River Basin.**

White, K.D., MP 5408, U.S. Army Cold Regions Research and Engineering Laboratory. *Ice engineering information exchange bulletin*, Apr. 1999, No.21, 6p., 10 refs.

River basins, River ice, Ice jams, Ice forecasting, Floods, Flood forecasting, Cost analysis, Data processing, Statistical analysis, United States—Susquehanna River

## 53-5214

**Promoting late-fall establishment of tall fescue with artificial soil covers to minimise soil erosion.**

Palazzo, A.J., MP 5409, *Environmental geochemistry and health*, 1994, 16(1), p.3-7, 13 refs.

Grasses, Protective vegetation, Revegetation, Covering, Soil erosion, Soil conservation, Soil stabilization, Land reclamation

Frequently, turfgrass seedings have been sown in the late fall, which usually results in a poor vegetative stand and the possibility of soil erosion the following spring. This study evaluates the effects of a spun-bonded polyester soil cover placed over a late-fall seeding on subsequent seedling growth and overwintering. Clemfine, Mustang, Rebel and Rebel II cultivars of tall fescue (*Festuca arundinacea* Schreb.) were sown on a silt loam soil in late fall (17 Oct. in 1989 and 19 Oct. in 1990) and allowed to grow with and without a soil cover until June. In the spring the temperature under the soil cover was greater than 2°C warmer than the uncovered soil from mid-Apr. through May. Over the winter, leaf and root weights showed no detrimental effects from being under the cover. Individual cultivars grown under the cover produced 2 to 11 times greater leaf yields and 38 to 270% better stand establishment than those sown on the exposed soil. However, plant winter injury was observed under the soil cover in small soil depressions which accumulated water originating from thawing. All cultivars had similar amounts of growth under the cover. However, leaf yields for Rebel were 30-55% less than the other cultivars when grown under the cover and this was probably related to a low seed germination rate. The covers also promoted weed growth, which comprised from 34-65% of total leaf weights and was found to be negatively correlated ( $r = -0.66$ ) to the yields of the sown grass. The soil cover was found to be beneficial to improving the success of seedling establishment of late seedings of tall fescue in cold areas.

## 53-5215

**High strain rate impact response of polycarbonate backed composite laminates.**

Vaidya, U.K., Hosur, M.V., Haque, A., Kulkarni, M., Mayer, A., Dutta, P.K., MP 5410, International Conference on Advanced Composites, Hurghada, Egypt, Dec. 15-18, 1998. ICAC 98, [1998], p.3-16, 8 refs.

Aircraft, Windows, Composite materials, Plastics, Polymers, Resins, Impact tests, Impact strength, Stress strain diagrams

Impact damage is of critical concern in aircraft structures using laminated carbon epoxy composites. Polycarbonate sheeting offers high impact resistance and is used in windshields and canopies. In the current study a hybrid construction of carbon epoxy composite laminate backed by polycarbonate sheeting has been investigated for its low velocity and high strain rate impact response. An instrumented drop weight impact tester has been used to investigate the low velocity impact response on 36 ply composite-polycarbonate samples. A compression Split Hopkinson Pressure Bar with 0.75" incident and transmission bars "with" and "without" dynamic recovery technique has been adopted in conducting the high strain rate experiments on 8, 16, 24, 32 and 48 ply-polycarbonate samples. In the absence of the dynamic recovery mechanism (referred to as the momentum trap gap), the specimen is subjected to multiple reflected stress waves. In the dynamic recovery technique, the sample is subjected to a controlled single compressive pulse, providing a better understanding of the damage evolution mechanisms. Between two configurations considered, with respect to the side facing the incident bar, in the first, the polycarbonate sheeting faced the incident bar, while in the second, the carbon/epoxy laminate faced the same. Damage evolution using both test configurations was investigated. The strain rates were varied from 108 to 544 per second.

## 53-5216

**Rapid stabilization of thawing soils for enhanced vehicle mobility: a field demonstration project.**

Kestler, M.A., Shoop, S.A., Henry, K.S., Stark, J.A., Affleck, R.T., CR 99-03, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Feb. 1999, 73p., ADA-364 193, 20 refs.

Soil stabilization, Ground thawing, Military operation, Roads, Trafficability, Geotextiles, Soil trafficability, Tires, Vehicles

Thawing soil presents a formidable challenge for vehicle operations cross-country and on unsurfaced roads. To mitigate the problem, a variety of stabilization techniques were evaluated for their suitability for rapid employment to enhance military vehicle operations. A combination of mechanical stabilization methods including several lightweight fills, geosynthetics, and tire and wood mats, were constructed and tested during the annual training exercises of the 229th Engineers of the Wisconsin National Guard during the difficult conditions of spring thaw. The techniques were evaluated for their expediency, ease of construction, trafficability, and durability. In general, chunkwood was an excellent replacement for gravel fill in forested area; tree slash (or other vegetation) was effective but labor intensive; wood mats and pallets were effective and reasonably durable; tire mats were extremely rugged and effective. A loader or crane was needed to place the large wood mats, tire mats, and fascines. Geocomposite materials (Geonet) were quickly installed and could withstand limited traffic (50 passes) without additional cover material. Geosynthetics reduced the amount of cover material and enhanced placement, effectiveness and removal when used under other materials to spread the load and keep them from sinking into the mud. All materials were damaged during the severe motion of a tank cornering except the large, smooth wood mats, but these were slippery on slopes. Results are summarized in a decision matrix for choosing the best technique depending on site conditions, material and equipment availability and utilization criteria.

## 53-5217

**Investigation of the Roosevelt Road Transmitter Site, Fort Richardson, Alaska, using ground-penetrating radar.**

Hunter, L.E., Delaney, A.J., Lawson, D.E., CR 99-04, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Mar. 1999, 16p., ADA-364 131, 10 refs.

Geophysical surveys, Mapping, Radar echoes, United States—Alaska—Fort Richardson

The Roosevelt Road Transmitter Site is the location of a decommissioned bunker on Fort Richardson, near Anchorage, AK. The site was used from World War II to the Korean War as part of an Alaskan communications network. The bunker and support buildings were vandalized following its decommissioning in the mid-1960s, resulting in PCB contamination of the bunker and soils around the above-ground transmitter annex. CRREL conducted a ground-penetrating radar (GPR) investigation of the site in June 1996, at the request of the Directorate of Public Works on Fort Richardson. Nine transect lines were established, each being profiled with 100- and 400-MHz antennas. Both antennas systems defined the extent of the bunker and identified the presence of buried utilities. The 100-MHz antenna provided large-scale resolution of the bunker, limits of site excavation, and large stratigraphic horizons in the undisturbed sediments. The 400-MHz antenna provided finer resolution that allowed identification of steel reinforcement in the bunker ceiling, utilidor walls and floor, and the walls of the inner and outer bunker. High amplitude resonance and hyperbolas in the record characterize the response from the Transmitter Annex foundation, buried pipes, and utilities. The GPR survey shows its utility for detecting the extent of abandoned underground structures and identifying the extent of original ground excavations.

## 53-5218

**Existence of traveling wave solutions to the problem of soil freezing described by a model called  $M_1$ .**

Nakano, Y., CR 99-05, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, Apr. 1999, 33p., ADA-365 516, 47 refs.

Soil freezing, Mathematical models, Frost heave, Soil water migration

The scientific study of soil freezing began in the early 1900s and an accurate mathematical description of the freezing process has been sought for nearly 80 years. Despite numerous publications on the subject, there is as yet no clear consensus on the mathematical model of soil freezing. In this report a mathematical model called  $M_1$  is presented. The existence of traveling wave solutions to the problem is shown. For a given fine-grained soil, such solutions are shown to exhibit three distinct behaviors depending on given thermal and hydraulic conditions. When a frost front ( $0^\circ\text{C}$  isotherm) advances, water is either attracted to the front or expelled from it. Under certain conditions an ice layer containing hardly any soil particles grows. The report describes how the traveling wave solutions have been used for the empirical verification of  $M_1$ .

## 53-5219

**Ice jams in river confluences.**

Ettema, R., Muste, M., Kruger, A., CR 99-06, *U.S. Army Cold Regions Research and Engineering Laboratory. Report*, May 1999, 61p., ADA-365 480, 43 refs.

Ice jams, River ice, Ice models, Hydraulics, River flow, Grounded ice, Ice cover, United States—Mississippi River, United States—Missouri River

Two laboratory models of confluences are corroborated with observations interpreted from field observations of ice jams in the vicinity of confluences. One model was used to identify the processes whereby ice can jam in confluences and to determine how selected parameters (e.g., confluence angle) influence them. The confluences of primary interest were those formed by channels whose beds are at about the same level. The second model was used to examine ice jam formation in the confluence of the Mississippi and Missouri Rivers. Three relatively complex processes were found to lead to ice jams: the merging of ice runs, hydrodynamic pressure from a confluent flow impacting an ice run from the second confluent channel, and ice congestion at a confluence bar. The latter process is a significant factor triggering ice jams at the confluence of the Mississippi and Missouri Rivers. Also, three simple processes account for many ice jams at river confluences: ice blocked by an ice cover in the confluence, large ice pieces arching at the confluence, and ice entering a region of sluggish flow. The main practical contributions of the study are formulations for estimating the maximum rate of ice conveyance through channel confluences, and the confirmation of the efficacy of a series of bendway weirs to mitigate ice jam formation at the confluence of the Mississippi and Missouri Rivers. The bendway weirs have additional benefits, such as greatly reducing the amount of ice accumulating in the approach to the Chain-of-Rocks Canal, which is located at the confluence exit.

## 53-5220

**Frost inhibition on turfgrass.**

Palazzo, A.J., Cary, T.J., Hardy, S.E., Nagle, J.A., SR 99-04, *U.S. Army Cold Regions Research and Engineering Laboratory. Special report*, Apr. 1999, 4p., ADA-362 232, 5 refs.

Frost resistance, Frost protection, Grasses, Cold tolerance

Frost is a common problem for golf courses in the early morning hours in the spring and fall. Walking on frosted turf turns it a dark bluish color initially and kills the leaf tissue, eventually causing an unsightly appearance. The objective of this study was to conduct a series of experiments to evaluate the effectiveness of a recently introduced frost-inhibition product called FROST-B-GONE (FBG) in preventing the formation of frost and subsequent damage to turfgrass. The material was studied at concentrations of 0, 5, 10, 15 and 20% and applied at a rate of 1629 L/ha. The results of these experiments showed that the FBG compound was effective in preventing frost on a bentgrass turf used for greens. Application of FBG at concentrations of 10, 15 and 20% six hours before frosting conditions was consistently effective in reducing the occurrence of frost on bentgrass leaf surfaces. FBG also had a residual frost-inhibition effect when the sod was frosted a second time without re-treatment. The frost-producing technique developed in these experiments proved successful with herbaceous plants and may be used to prepare plants for cold-tolerance or satellite-identification studies.

## 53-5221

**Radiative characteristics in a Japanese forested drainage basin during snowmelt.**

Nakabayashi, H., Ishikawa, N., Kodama, Y., *Hydrological processes*, Feb. 15, 1999, 13(2), p.157-167, 13 refs.

Snow hydrology, Snowmelt, Snow heat flux, Albedo, Radiation balance, Forest land, Forest canopy, Run-off forecasting, Japan

## 53-5222

**Fractal dimensions of suspended solids in streams: comparison of sampling and analysis techniques.**

De Boer, D.H., Stone, M., *Hydrological processes*, Feb. 15, 1999, 13(2), p.239-254, 22 refs.

Snow hydrology, Snowmelt, Stream flow, Suspended sediments, Alluvium, Sediment transport, Particle size distribution, Statistical analysis, Canada—Ontario

## 53-5223

**Modelling the risk of snow damage to forests under short-term snow loading.**

Päätaalo, M.L., Peltola, H., Kellomäki, S., *Forest ecology and management*, Apr. 12, 1999, 116(1-3), p.51-70, 60 refs.

Trees (plants), Plant ecology, Snow loads, Wind pressure, Statistical analysis

## 53-5224

**Thermographic evaluation of window structures for antarctic environment.**

Dutta, P.K., MP 5411, *SPIE—The International Society for Optical Engineering. Proceedings*, 1999, Vol.3585, Nondestructive Evaluation of Aging Materials and Composites III, Newport Beach, CA, Mar. 3-5, 1999, p.73-83, 2 refs.

Buildings, Windows, Composite materials, Plastics, Polymers, Thermal insulation, Weatherproofing, Frost protection, Cold weather construction, Frost resistance, Low temperature tests, Thermal analysis, Thermal stresses, Antarctica—Amundsen-Scott Station

This study evaluates the performance of three different prototype commercial windows at extremely low temperature by exposing them to an environment similar to the condition in the US South Pole Station building in Antarctica. While the interior of the building will have a temperature of  $24^\circ\text{C}$ , the outside temperature will vary from  $-70^\circ\text{C}$  to about  $-5^\circ\text{C}$  on a sunny day. The differential expansion or contraction of the component materials may produce unacceptably high stresses, which may cause either the failure of the components, or degradation of performance over time. This investigation was an effort to assess such degradation, if any. Simultaneous evaluation tests were performed on four windows, two from one manufacturer, and one each from two other manufacturers.

## 53-5225

**Structure and mechanical behavior of ice.**

Schulson, E.M., *JOM: Minerals, Metals & Materials Society. Journal*, Feb. 1999, 51(2), p.21-27, 80 refs.

Ice structure, Ice crystal structure, Ice strength, Ice deformation, Ice cracks, Ice breaking

## 53-5226

**Simple procedure for ion chromatographic determination of anions and cations at trace levels in ice core samples.**

Jauhainen, T., Moore, J., Perämäki, P., Derome, J., Derome, K., *Analytica chimica acta*, 1999, Vol.389, p.21-29, 18 refs.

Ice cores, Core samplers, Ice composition, Impurities, Ion density (concentration), Chemical analysis

## 53-5227

**Wintertime convection and frontal interleaving in the southern ocean.**

Toole, J.M., Cambridge, Massachusetts Institute of Technology/Woods Hole Oceanographic Institution, 1980, 326p., PB80-197601, Ph.D. thesis. Refs. p.315-325. Also published as Woods Hole Oceanographic Institution report WHOI-80-25.

Polar atmospheres, Marine atmospheres, Air water interactions, Ice cover effect, Ocean currents, Water transport, Water temperature, Salinity, Heat flux, Mathematical models

## 53-5228

**Activity of soil microarthropods beneath snow-pack in alpine tundra and subalpine forest.**

Addington, R.N., Seastedt, T.R., *Pedobiologia*, Jan. 1999, 43(1), p.47-53, 25 refs.

Alpine tundra, Forest tundra, Forest ecosystems, Soil microbiology, Soil temperature, Snow cover effect, Ecology, Cryobiology, Cold tolerance, United States—Colorado—Front Range

## 53-5229

**Platinum-group elements (Rh, Pt, Pd) and Au distribution in snow samples from the Kola Peninsula, NW Russia.**

Gregurek, D., Melcher, F., Niskavaara, H., Pavlov, V.A., Reimann, C., Stumpf, E.F., *Atmospheric environment*, Sep. 1999, 33(20), p.3281-3290, 25 refs.

Polar atmospheres, Atmospheric circulation, Atmospheric composition, Air pollution, Scavenging, Snow samplers, Snow composition, Snow impurities, Mineralogy, Chemical analysis, Russia—Kola Peninsula

## 53-5230

**Patterns of precipitation and pollutant deposition in the western Sudete Mountains, Poland.**

Dore, A.J., Sobik, M., Migala, K., *Atmospheric environment*, Sep. 1999, 33(20), p.3301-3312, 20 refs.

Atmospheric circulation, Atmospheric composition, Air pollution, Precipitation (meteorology), Scavenging, Snow composition, Snow impurities, Poland—Sudete Mountains



53-5231

**Influence of ground water on surface water conditions in a glacial flood plain of the Swiss Alps.**  
Ward, J.V., Malard, F., Tockner, K., Uehlinger, U., *Hydrological processes*, Feb. 28, 1999, 13(3), Special issue: Groundwater dominated rivers, p.277-293, 47 refs.  
Glacial hydrology, Meltwater, Subglacial drainage, Ground water, Stream flow, Floodplains, Alluvium, Ecosystems, Ecology, Switzerland—Alps

53-5232

**Groundwater and fish—insights from northern North America.**

Power, G., Brown, R.S., Imhof, J.G., *Hydrological processes*, Feb. 28, 1999, 13(3), Special issue: Groundwater dominated rivers, p.401-422, Refs. p.419-422.  
River ice, Ice conditions, Ice cover effect, Ground water, Animals, Ecosystems, Ecology, North America

53-5233

**Radar interferometry and its application to changes in the Earth's surface.**

Massonnet, D., Feigl, K.L., *Reviews of geophysics*, Nov. 1998, 36(4), p.441-500, Refs. p.495-500.  
Synthetic aperture radar, Radio echo soundings, Spaceborne photography, Image processing, Geodetic surveys, Topographic surveys, Terrain identification, Glacier surveys, Glacier flow

53-5234

**Thermal plasma and neutral gas in Saturn's magnetosphere.**

Richardson, J.D., *Reviews of geophysics*, Nov. 1998, 36(4), p.501-524, 62 refs.  
Planetary environments, Atmospheric composition, Satellites (natural), Extraterrestrial ice, Ice sublimation, Ionization

53-5235

**Postglacial variations in the level of the sea: implications for climate dynamics and solid-earth geophysics.**

Peltier, W.R., *Reviews of geophysics*, Nov. 1998, 36(4), p.603-689, Refs. p.685-689.  
Ice age theory, Pleistocene, Glaciation, Glacial geology, Glacier oscillation, Global change, Paleoclimatology, Earth crust, Geodesy, Isostasy, Marine geology, Sea level, Rheology, Ice models, Mathematical models, Computerized simulation

53-5236

**Similarity solutions in a class of thawing processes.**

Fasano, A., Primicerio, M., Tarzia, D., *Mathematical models & methods in applied sciences*, Feb. 1999, 9(1), p.1-10, 13 refs.  
Thawing rate, Phase transformations, Liquid solid interfaces, Ground thawing, Stefan problem, Mathematical models

53-5237

**Coupled transport of heat and mass. Theory and applications.**

Ratkje, S.K., Hafskjold, B., Entropy and entropy generation: fundamentals and applications. Edited by J.S. Shiner. Understanding chemical reactivity, Vol.18, Dordrecht, Kluwer Academic Publishers, 1996, p.197-219, 35 refs.  
DLC QC318.E57 E56 1996  
Phase transformations, Liquid solid interfaces, Molecular energy levels, Heat transfer, Mass transfer, Thermodynamics, Mathematical models

53-5238

**Correlation of index tests with rock durability.**

Lienhart, D.A., Fisher, H.H., Robinson, E.F., River, coastal and shore protection: erosion control using riprap and armourstone. Edited by C.R. Thorne, et al., Chichester, England, John Wiley & Sons, Ltd., 1995, p.502-509, 4 refs. Includes discussion and closure.  
DLC TC337.R57 1995  
Bank protection (waterways), Rock fills, Frost weathering, Rock properties, Rock mechanics

53-5239

**Proceedings.**

International Congress on Environmental Geotechnics, 1st, Edmonton, Alberta, July 11-15, 1994, Carrier, W.D., III, ed, Richmond, British Columbia, BiTech Publishers Ltd., 1994, 1014p., In English and French. Refs. passim. For selected papers see 53-5240 through 53-5243.

DLC TD171.9.I52 1994

Mining, Waste disposal, Permafrost control, Permafrost preservation, Soil stabilization, Land reclamation

53-5240

**Geotechnical aspects of environmental violations in cryolitic zone.**

Grebenets, V.I., Lolaev, A.B., Fedoseev, D.B., Savchenko, V.A., International Congress on Environmental Geotechnics, 1st, Edmonton, Alberta, July 11-15, 1994. Proceedings. Edited by W.D. Carrier, III, Richmond, British Columbia, BiTech Publishers, Ltd., 1994, p.247-254, 3 refs.

DLC TD171.9.I52 1994

Mining, Environmental protection, Permafrost preservation, Permafrost control, Soil stabilization, Russia—Noril'sk

53-5241

**Use of geomembranes as vertical barrier liners for containment on the North Slope of Alaska.**

Hansen, P.G., Crotty, G.R., International Congress on Environmental Geotechnics, 1st, Edmonton, Alberta, July 11-15, 1994. Proceedings. Edited by W.D. Carrier, III, Richmond, British Columbia, BiTech Publishers, Ltd., 1994, p.255-260.

DLC TD171.9.I52 1994

Drilling, Trenching, Frozen ground strength, Permafrost control, Permafrost preservation, Geotextiles, Thermal insulation, Soil stabilization, United States—Alaska—North Slope

53-5242

**Using glacial till as liner material for a waste disposal.**

Sjöholm, M., Strandberg, T., International Congress on Environmental Geotechnics, 1st, Edmonton, Alberta, July 11-15, 1994. Proceedings. Edited by W.D. Carrier, III, Richmond, British Columbia, BiTech Publishers, Ltd., 1994, p.367-371, 5 refs.

DLC TD171.9.I52 1994

Glacial till, Clay soils, Earth fills, Permeability, Linings, Waste disposal, Soil stabilization, Finland

53-5243

**Geoenvironmental design of a uranium mill tailings facility in northern Saskatchewan.**

Mittal, H.K., Holl, N., Donald, S., International Congress on Environmental Geotechnics, 1st, Edmonton, Alberta, July 11-15, 1994. Proceedings. Edited by W.D. Carrier, III, Richmond, British Columbia, BiTech Publishers, Ltd., 1994, p.887-893.

DLC TD171.9.I52 1994

Mining, Tailings, Waste disposal, Land reclamation, Soil pollution, Permafrost control, Permafrost preservation, Canada—Saskatchewan

53-5244

**Geological aspects of the deep disposal of radioactive waste.**

McEwen, T.J., NATO Advanced Research Workshop on Defence Nuclear Waste Disposal in Russia: implications for the environment, Krasnoyarsk, Russia, June 24-28, 1996. Proceedings. ASI Series 1: Disarmament technologies. Vol.18. Edited by M.J. Stenhouse and V.I. Kirko, Dordrecht, Kluwer Academic Publishers, 1998, p.99-120, 24 refs.

DLC TD897.85.D44 1998

Radioactive wastes, Waste disposal, Ground water, Geology, Hydrogeology, Rock mechanics, Permafrost, Tectonics, Glacial hydrology, Safety

53-5245

**Evaluation of the safe disposal of radioactive waste and spent fuel in the vicinity of Bashmach-naya Bay on the Novaya Zemlya Archipelago.**

Mel'nikov, N.N., Konukir, V.P., Komlev, V.N., NATO Advanced Research Workshop on Defence Nuclear Waste Disposal in Russia: implications for the environment, Krasnoyarsk, Russia, June 24-28, 1996. Proceedings. ASI Series 1: Disarmament technologies. Vol.18. Edited by M.J. Stenhouse and V.I. Kirko, Dordrecht, Kluwer Academic Publishers, 1998, p.309-315, 5 refs.

DLC TD897.85.D44 1998

Radioactive wastes, Waste disposal, Permafrost, Frozen rocks, Fuels, Military operation, Ships, Geocryology, Russia—Novaya Zemlya

53-5246

**Proceedings.**

International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998, Reston, VA, American Society of Civil Engineers (ASCE), 1998, 1920p. (2 vols.), Refs. passim. For selected papers see 52-6737, 52-6738, and 53-5247 through 53-5253.

DLC TC5.I696 1998

Floods, Flood forecasting, Flood control, Snowstorms, Snowfall, Snow hydrology, Snowmelt, Run-off forecasting, Bridges, Water erosion

53-5247

**Scour measurements at contracted highway crossings in Minnesota, 1997.**

Mueller, D.S., Hitchcock, H.A., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.1, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.210-215, 6 refs.

DLC TC5.I696 1998

Snowstorms, Snowfall, Snowmelt, Floodplains, Floods, Water erosion, Bridges, Road maintenance, United States—Minnesota

53-5248

**Restoration of boreal lowland rivers in Finland: problems and approaches with respect to conservation and flood protection.**

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DLC TC5.I696 1998

Forest ecosystems, Forest land, Soil conservation, Flood control, Land reclamation, Finland

53-5249

**Perspectives on the 1997 flooding: Red River of the North.**

James, L.D., Korom, S.F., Galloway, G., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.1, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.756-761.

DLC TC5.I696 1998

Snowfall, Snowstorms, Snowmelt, Floods, Accidents, Rescue operations, Cost analysis, United States—North Dakota—Grand Forks

53-5250

**1997 Red River floods: what went wrong?**

Pielke, R.A., Jr., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.1, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.762-767, 14 refs.

DLC TC5.I696 1998

Snowfall, Snowstorms, Snowmelt, Floods, Accidents, Flood forecasting, Flood control, Rescue operations, United States—North Dakota, United States—Minnesota



- 53-5251**  
Development of simple snow density model for wide area.  
Kazama, S., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.2, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.1230-1235, 5 refs. DLC TC5.I696 1998  
Snow hydrology, Snow depth, Snow heat flux, Snow density, Snow water equivalent, Snowmelt, Runoff forecasting, Mathematical models, Japan
- 53-5252**  
Coincident frequency in snowmelt runoff modeling.  
Van Mullem, J.A., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.2, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.1303-1308, 6 refs.  
DLC TC5.I696 1998  
Snow hydrology, Snow cover distribution, Snow depth, Snow water equivalent, Snowmelt, Degree days, Runoff forecasting, Statistical analysis, Computerized simulation, United States—Montana
- 53-5253**  
Selection of an appropriate hydrologic analysis method to simulate a watershed response: Ashland Creek case study.  
Mohammadi, A., Magura, L.M., Fuller, R.B., International Water Resources Engineering Conference, Memphis, TN, Aug. 3-7, 1998. Proceedings. Vol.2, Reston, VA, American Society of Civil Engineers (ASCE), 1998, p.1309-1314, 7 refs.  
DLC TC5.I696 1998  
Snow hydrology, Rain, Snowmelt, Floods, Accidents, Flood forecasting, Computerized simulation, United States—Oregon—Ashland
- 53-5254**  
Arctic Ocean Buoy Program, data report, 1 January 1980-31 December 1980.  
Thordike, A.S., Colony, R., University of Washington, Seattle, Polar Science Center, 1981, 127p., 6 refs.  
Polar atmospheres, Marine meteorology, Drift stations, Drift, Air temperature, Surface temperature, Atmospheric pressure, Data transmission, Data processing
- 53-5255**  
Measurement and control of ice adhesion to aluminum 6061 alloy.  
Archer, P., Gupta, V., *Journal of the mechanics and physics of solids*, 1998, 46(10), p.1745-1771, 31 refs.  
Metals, Ice solid interface, Ice adhesion, Ice strength, Ice loads, Protective coatings, Ice prevention, Ice removal, Ice breaking
- 53-5256**  
New predictions on the sticking of HCl to ice at hyperthermal energies.  
Al-Halabi, A., Kleyn, A.W., Kroes, G.J., *Chemical physics letters*, July 9, 1999, Vol.307, p.505-510, 34 refs.  
Ice crystal structure, Ice crystal collision, Ice crystal adhesion, Ice composition, Molecular energy levels, Adsorption, Ozone
- 53-5257**  
Examination of the distribution of snow on sea-ice.  
Iacozza, J., Barber, D.G., *Atmosphere-ocean*, 1999, 37(1), p.21-51, With French summary. 32 refs.  
Air ice water interaction, Sea ice, Snow ice interface, Snow cover distribution, Snow depth, Snow heat flux, Snow hydrology, Snow optics, Snow cover effect, Photosynthesis
- 53-5258**  
Simulation of ground-water flow at Anchorage, Alaska, 1955-83.  
Patrick, L.D., Brabets, T.P., Glass, R.L., *U.S. Geological Society. Water-resources investigations report*, 1989, No.88-4139, 41p., 12 refs.  
Hydrogeology, Ground water, Water table, Water flow, Wells, Water reserves, Water supply, Computerized simulation, United States—Alaska—Anchorage
- 53-5259**  
Solar and terrestrial radiation interaction between arctic sea ice and clouds. [Solare und terrestrische Strahlungswechselwirkung zwischen arktischen Eisflächen und Wolken]  
Freese, D., *Berichte zur Polarforschung*, 1999, No.312, 116p., In German with English summary. Refs. p.98-102.  
Sea ice, Solar radiation, Boundary layer, Backscattering, Cloud physics, Atmospheric physics, Polar atmospheres, Ice air interface, Heat balance, Mathematical models, Norway—Svalbard
- 53-5260**  
Paleoecological evidence of climate change and historical patterns of planktonic diatom diversity inferred from the Lake Baikal (Russia) sediment record.  
Edlund, M.B., Ann Arbor, University of Michigan, 1998, 166p., University Microfilms order No.9840528, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 59(7), Jan. 1999, p.3311.  
Lacustrine deposits, Bottom sediment, Drill core analysis, Plankton, Algae, Fossils, Biomass, Paleoecology, Climatic changes, Global change, Paleoclimatology, Russia—Baykal, Lake
- 53-5261**  
Glacial geology and study of the mercury content in till, central British Columbia. [Géologie glaciaire et étude du contenu mercure dans le till, partie centrale de la Colombie-Britannique]  
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Geological surveys, Glaciation, Glacial geology, Glacier oscillation, Glacier flow, Glacial erosion, Glacial deposits, Glacial till, Quaternary deposits, Sediment transport, Geochemistry, Mineralogy, Soil dating, Geochronology, Paleoclimatology, Canada—British Columbia
- 53-5262**  
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Glaciation, Ice sheets, Geological surveys, Glacial geology, Glacial deposits, Glacier oscillation, Geomorphology, Stratigraphy, Geochronology, Paleoclimatology, Canada—Alberta—Waterton Lakes National Park
- 53-5263**  
Estimation of climate change effects on stream-flows, stream temperatures and fish thermal habitat.  
Mohseni, O., Minneapolis, University of Minnesota, 1999, 286p., University Microfilms order No.9918172, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 60(2), Aug. 1999, p.753.  
Snow hydrology, Snowmelt, Runoff forecasting, Stream flow, Snow cover effect, Water temperature, Animals, Ecosystems, Ecology, Global warming
- 53-5264**  
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Polar atmospheres, Atmospheric circulation, Atmospheric composition, Aerosols, Dust, Volcanic ash, Ice cores, Ice composition, Drill core analysis, Global change, Paleoclimatology, Greenland, Canada—Northwest Territories—Baffin Island
- 53-5265**  
Study of atmospheric icing formation and forces.  
Yoon, B.M., Iowa City, University of Iowa, 1991, 236p., University Microfilms order No.9137014, Ph.D. thesis. For abstract see Dissertation abstracts international, Sec. B, 52(7), Jan. 1992, p.3783.  
Power line icing, Ice accretion, Ice loads, Wind pressure
- 53-5266**  
Fermentation kinetics and process development in the production of delcers (calcium magnesium acetate and calcium magnesium propionate) from lactose of whey.  
Fu, W.G., Manhattan, Kansas State University, 1998, 262p., University Microfilms order No.9914205, Ph.D. thesis. Refs. passim.  
Road icing, Chemical ice prevention, Biomass, Waste disposal, Microbiology, Bacteria, Fungi, Road maintenance, Cost analysis, Computer programs
- 53-5267**  
Postglacial depositional history of the Laptev Sea: mineralogy and sedimentology. [Die postglaziale Sedimentationsgeschichte der Lapteewsee: schwermineralogische und sedimentpetrographische Untersuchungen]  
Peregovich, B., *Berichte zur Polarforschung*, 1999, No.316, 85p., In German with English and Russian summaries. Refs. p.73-83.  
Sediment transport, Marine deposits, Sea ice, Sedimentation, Minerals, Shore erosion, Russia—Laptev Sea
- 53-5268**  
Russian-German cooperation SYSTEM LAPTEV SEA 2000: the Lena Delta 1998 expedition.  
Rachold, V., ed, Grigor'ev, M.N., ed, *Berichte zur Polarforschung*, 1999, No.315, Expeditions in Siberia in 1998. Edited by V. Rachold, p.1-259, Refs. passim.  
Expeditions, Climatic changes, Greenhouse effect, Geochronology, Seasonal variations, Ecosystems, Permafrost, Soil microbiology, Carbon dioxide, Subsea permafrost, Active layer, Sedimentation, Deltas, Paleoclimatology, Ground ice, Russia—Laptev Sea, Russia—Lena Delta
- 53-5269**  
EURASIAN ICE SHEETS: expedition to the lake Lyadhej-To (Polar Urals), July-August 1998.  
Hermichen, W.D., Wischer, F., *Berichte zur Polarforschung*, 1999, No.315, Expeditions in Siberia in 1998. Edited by V. Rachold, p.261-268, 4 refs.  
Expeditions, Glacial lakes, Lacustrine deposits, Mapping, Lake water, Water chemistry, Core samplers, Geomorphology, Glacial geology, Russia—Ural Mountains
- 53-5270**  
Persistent organic compounds in the Barents Sea: Canada-Russia collaboration on arctic pollutants.  
Skibo, D.N., Nassichuk, W.W., *Canada. Geological Survey. Current research. Part B*, 1994, No.1994-B, p.1-9, With French summary. 39 refs.  
DLC QE48.C2 Pt.B 1994  
Water pollution, Environmental impact, Sea water, Water chemistry, Suspended sediments, Bottom sediment, Barents Sea
- 53-5271**  
Geophysical studies of massive ground ice, Foshelm Peninsula, Ellesmere Island, Northwest Territories.  
Robinson, S.D., *Canada. Geological Survey. Current research. Part B*, 1994, No.1994-B, p.11-18, With French Summary. 28 refs.  
DLC QE48.C2 Pt.B 1994  
Permafrost surveys, Permafrost distribution, Permafrost thickness, Ground ice, Ice detection, Electromagnetic prospecting, Gravimetric prospecting, Subsurface investigations, Canada—Northwest Territories—Ellesmere Island

53-5272

Active layer monitoring in natural environments, Mackenzie Valley, Northwest Territories.

Nixon, F.M., Taylor, A.E., *Canada. Geological Survey. Current research. Part B*, 1994, No.1994-B, p.27-34, With French Summary. 32 refs.

DLC QE48.C2 Pt.B 1994

Permafrost surveys, Permafrost thickness, Permafrost thermal properties, Frozen ground temperature, Permafrost hydrology, Permafrost forecasting, Active layer, Thaw depth, Thermokarst, Canada—Northwest Territories—Mackenzie River

53-5273

Paleolimnology and global change on the southern Canadian prairies.

Vance, R.E., Last, W.M., *Canada. Geological Survey. Current research. Part B*, 1994, No.1994-B, p.49-58, With French Summary. 24 refs.

DLC QE48.C2 Pt.B 1994

Plains, Limnology, Lakes, Lake water, Water chemistry, Water level, Lacustrine deposits, Vegetation patterns, Paleobotany, Soil dating, Paleoclimatology, Climatic changes, Global warming, Canada

53-5274

Ice flow and late glacial lakes of the Fraser Glaciation, central British Columbia.

Plouffe, A., *Canada. Geological Survey. Current research. Part A*, 1997, No.1997-A, p.133-143, With French Summary. 37 refs.

DLC QE48.C2 1997-A, 1997-B

Geological surveys, Glacial geology, Glaciation, Glacier oscillation, Glacial deposits, Glacial till, Glacier flow, Striations, Glacial lakes, Lacustrine deposits, Geochronology, Paleoclimatology, Canada—British Columbia

53-5275

Quaternary geology and terrain inventory, Eastern Cordillera NATMAP Project. Report 4: investigation of continental and montane advances in the Beaver Mines map area, southwestern Alberta.

Holme, P.J., *Canada. Geological Survey. Current research. Part A*, 1997, No.1997-A, p.177-182, With French Summary. 15 refs.

DLC QE48.C2 1997-A, 1997-B

Geological surveys, Pleistocene, Ice sheets, Alpine glaciation, Glacier oscillation, Glacial geology, Glacial deposits, Glacial till, Outwash, Quaternary deposits, Stratigraphy, Paleoclimatology, Canada—Alberta—Waterton Lakes National Park

53-5276

Quaternary geology of the Nass River region, British Columbia.

McCuaig, S.J., *Canada. Geological Survey. Current research. Part A*, 1997, No.1997-A, p.183-189, With French Summary. 13 refs.

DLC QE48.C2 1997-A, 1997-B

Geological surveys, Glaciation, Glacial geology, Glacier flow, Glacial deposits, Glacial till, Marine deposits, Lacustrine deposits, Quaternary deposits, Stratigraphy, Canada—British Columbia—Nass River

53-5277

Proceedings. Comparison between Oyashio region and Bering Sea ecosystems.

International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998, Ohtani, K., ed, Miyake, H., ed, Sakurai, Y., ed, Tyler, A.V., ed, *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), 130p., Refs. passim. For selected papers see 53-5278 through 53-5287.

Oceanographic surveys, Ocean currents, Water transport, Water temperature, Salinity, Marine biology, Ecosystems, Ecology, Plankton, Algae, Nutrient cycle, Biomass, Bering Sea, Okhotsk Sea, Japan—Hokkaido

53-5278

Bering Sea ecosystem: current and proposed programs addressing lower trophic level responses to climatic change.

Alexander, V., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.4-10, 16 refs.

Research projects, Oceanographic surveys, Climatic changes, Ocean currents, Water transport, Marine biology, Ecosystems, Ecology, Nutrient cycle, Biomass, Bering Sea

53-5279

Coastal Oyashio Multidisciplinary and Advanced Study (COMPAS) program using new ocean color remote sensing and intensive ship observations.

Sasaoka, K., Saitoh, S., Ban, S., Kudoh, I., Miyake, H., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.11-17, 6 refs.

Oceanographic surveys, Ocean currents, Water transport, Water temperature, Surface temperature, Marine biology, Plankton, Algae, Chlorophylls, Biomass, Radiometry, Spaceborne photography, Bering Sea, Okhotsk Sea, Japan—Hokkaido

53-5280

Satellite and ship observations of coastal upwelling in the St. Lawrence Island Polynya (SLIP) area in summer, 1994 and 1995.

Saitoh, S., Eslinger, D.L., Sasaki, H., Shiga, N., Odate, T., Miyoi, T., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.18-23, 7 refs.

Oceanographic surveys, Polynyas, Wind factors, Upwelling, Marine biology, Plankton, Algae, Chlorophylls, Biomass, Radiometry, Spaceborne photography, Bering Sea

53-5281

Tidal current in the Bering Sea: shelf-deep basin exchange.

Kowalik, Z., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.24-29, 15 refs.

Ocean currents, Tidal currents, Water transport, Diurnal variations, Nutrient cycle, Biomass, Bering Sea

53-5282

Fluctuations of nutrients and primary production structure during winter and spring in Funka Bay.

Iinuma, T., Imai, K., Odate, T., Maita, Y., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.30-35, 10 refs. Funka (Japanese for Volcano) is the popular name for Uchura Bay in Hokkaido.

Oceanographic surveys, Ocean currents, Water transport, Marine biology, Plankton, Algae, Chlorophylls, Nutrient cycle, Biomass, Japan—Hokkaido, Okhotsk Sea

53-5283

Short-time variation in low trophic level productivity and hydrographic conditions in Funka Bay.

Miyake, H., Yanada, M., Nishi, T., Hoshizawa, K., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.36-41, 13 refs.

Oceanographic surveys, Ocean currents, Water transport, Water temperature, Salinity, Marine biology, Suspended sediments, Plankton, Algae, Nutrient cycle, Biomass, Okhotsk Sea, Japan—Hokkaido

53-5284

Succession of the calanoid copepod community in Funka Bay during spring phytoplankton bloom.

Ban, S., Miyagawa, Y., Okuda, Y., Shiga, N., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.42-47, 10 refs.

Oceanographic surveys, Ocean currents, Water transport, Water temperature, Salinity, Marine biology, Plankton, Algae, Biomass, Okhotsk Sea, Japan—Hokkaido

53-5285

Interannual variation and vertical distribution of appendicularians in the south of St. Lawrence Island, northern Bering Sea shelf, in summer.

Shiga, N., Takagi, S., Nishiuchi, K., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.48-51, 10 refs.

Oceanographic surveys, Polynyas, Water temperature, Salinity, Marine biology, Ecology, Plankton, Biomass, Bering Sea

53-5286

Temporal changes in distribution of walleye pollock eggs south of Hokkaido, Japan.

Kono, T., Watanabe, K., Yabuki, K., Hamatsu, T., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.52-55, 9 refs.

Oceanographic surveys, Ocean currents, Water transport, Water temperature, Salinity, Marine biology, Ecology, Okhotsk Sea, Japan—Hokkaido

53-5287

Numerical simulations of the transport process of walleye pollock eggs into Funka Bay.

Shimizu, M., Isoda, Y., *Hokkaido University, Hakodate. Faculty of Fisheries. Memoirs*, Sep. 1998, 45(1), International Symposium on the Subarctic Fisheries Oceanography, Hakodate, Hokkaido, Japan, Jan. 29-30, 1998. Proceedings. Comparison between Oyashio region and Bering Sea ecosystems. Edited by K. Ohtani, H. Miyake, Y. Sakurai, and A.V. Tyler, p.56-59, 7 refs.

Ocean currents, Water transport, Air water interactions, Wind factors, Wind direction, Marine biology, Ecology, Okhotsk Sea, Japan—Hokkaido

53-5288

Vistula glaciation in the Bramka region in the western part of the Mazury Lakeland. [Zlodowacenie Wisły w rejonie Bramki w zachodniej części Pojezierza Mazurskiego]

Roman, M., *Kwartalnik geologiczny*, 1990, 34(2), p.325-337, In Polish with Russian and English summaries. 28 refs.

DLC QE1.W26 Vol.34 1990

Glaciation, Quaternary deposits, Paleoclimatology, Outwash, Glacier tongues, Glacial lakes, Glacial deposits, Poland

53-5289

Question of the age and glaciers extent during the Last Glaciation (Vistulian) in the Polish Tatra Mts. [Problem wieku i zasięgu lodowców ostatniego zlodowacenia (Vistulian) w Tatrach Polskich]

Lindner, L., Dzierżek, J., Nitychoruk, J., *Kwartalnik geologiczny*, 1990, 34(2), p.339-353, In Polish with Russian and English summaries. 58 refs.

DLC QE1.W26 Vol.34 1990

Alpine glaciation, Mountain glaciers, Paleoclimatology, Glacial deposits, Age determination, Poland—Tatra Mountains

53-5290

Glaciers.

Knight, P.G., Cheltenham, England, Stanley Thornes (Publishers) Ltd., 1999, 261p., Refs. p.227-256.

Glaciology, Glacier oscillation, Glacier mass balance, Glacial hydrology, Glacial meteorology, Glacier flow, Glacier ice, Firm, Ice cores, Ice temperature, Ice composition, Global change

53-5291

Inventory of surging glaciers of the Pamirs. [Katalog pul'sirulushchikh lednikov Pamira]

Osipova, G.B., Tsvetkov, D.G., Shchetinnikov, A.S., Rudak, M.S., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.137-147, In Russian with English summary. Refs. p.134-136.

DLC QE575.A43

Glacier surges, Glacier surveys, Mountain glaciers, Classifications, Pamirs, CIS—Central Asia

53-5292

Vostok Lake, Antarctica (glaciological, biological, planetary aspects). [Ozero Vostok, Antarktida (glatsiologicheskii, biologicheskii, planetologicheskii aspekty)]

Zotikov, I.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.137-147, In Russian with English summary. 33 refs.

DLC QE575.A43

Glacial lakes, Subglacial observations, Subglacial drainage, Radio echo soundings, Ice sheets, Geothermal thawing, Antarctica—Vostok Station

53-5293

On connection of density of surface ice layer in Antarctica with wind velocity. [O svyazi plotnosti poverkhnostnogo sloia snega v Antarktide so skorost'iu vetra]

Lipencov, V.I.A., Ekalkin, A.A., Barkov, N.I., Pourchet, M., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.148-158, In Russian with English summary. 44 refs.

DLC QE575.A43

Snow density, Snow air interface, Wind velocity, Air temperature, Statistical analysis, Wind factors, Antarctica

53-5294

Numerical model of the dynamics of ice sheet along fixed pipe of flow taking into account effects of isostasy and interaction with sea. [Chislennaya model' dinamiki lednikovogo pokrova vdol' fiksirovannoi trubki toka s uchetom izostazii i vzaimodeistviia s morem]

Malikova, D.R., Salamatina, A.N., Duval, P., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.159-165, In Russian with English summary. 20 refs.

DLC QE575.A43

Mathematical models, Ice water interface, Isostasy, Ice sheets, Glacier flow, Sea level, Antarctica—Mirny Station, Antarctica—East Antarctica

53-5295

Satellite topographic monitoring of glaciological landscapes of high latitude Arctic. [Sputnikovyi topograficheskii monitoring lednikovoykh landshtaftov vysokoshirnotoi Arktiki]

Sharov, A.I., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.166-177, In Russian with English summary. 13 refs.

DLC QE575.A43

Spaceborne photography, Topographic surveys, Glacier surveys, Remote sensing, Topographic maps, Geodetic surveys, Sea level, Radiometry, Ice cover thickness, Image processing, Russia—Franz Josef Land

53-5296

Modelling of flow of outlet glaciers on Vilchek Land, Franz Josef Land. [Modellirovanie tekhnika vyvodykh lednikov Zemli Vil'cheka, Zemlia Frantsa-Iosifa]

Vil'chinskii, A.V., Chugunov, V.A., Glazovskii, A.F., Macheret, I.U.I.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.178-186, In Russian with English summary. 16 refs.

DLC QE575.A43

Mathematical models, Glacier mass balance, Glacier surveys, Glacier flow, Basal sliding, Bedrock, Ice water interface, Russia—Franz Josef Land

53-5297

Peculiarities of the dynamics of subpolar glaciers as a result of climate changes. [Osobennosti dinamiki subpolarnykh lednikov pri izmeneniiakh klimata]

Glazovskii, A.F., Krass, M.S., Macheret, I.U.I.A., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.187-195, In Russian with English summary. 21 refs.

DLC QE575.A43

Climatic changes, Climatic factors, Glacier surges, Thermal regime, Heat flux, Ice thermal properties, Mathematical models, Glacier melting, Norway—Spitsbergen

53-5298

Present-day fluctuations of Vavilov Ice dome on Severnaya Zemlya. [Sovremennye kolebania lednikovogo kupola Vavilova na Severnoi Zemle]

Golubev, V.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.196-204, In Russian with English summary. 30 refs.

DLC QE575.A43

Glacier oscillation, Glacier alimentation, Glacier flow, Glacier melting, Glacier ablation, Russia—Severnaya Zemlya, Russia—Vavilov Ice Dome

53-5299

Last deglaciation of Barents Kara shelf, the role of gravitational collapses and surges. [Posledniiaa deglatsiatsiia Barentsevo-Karskogo shel'fa: rol' gravitatsionnykh kollapsov i serdzhel]

Grosval'd, M.G., Krass, M.S., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.205-218, In Russian with English summary. 57 refs.

DLC QE575.A43

Ocean bottom, Paleoclimatology, Moraines, Ice cover, Thermal regime, Temperature effects, Marine geology, Glacial geology, Barents Sea, Russia—Kara Sea

53-5300

New data on the present day and ancient glaciation of Taimir and Severnaya Zemlya areas. [Novye dannye o sovremennom i drevnem oledeneniï Taimyro-Severozemel'skoi oblasti]

Bol'shiianov, D.I.U., Savatiugin, L.M., Shneider, G.V., Molodkov, A.N., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.219-222, In Russian with English summary. 12 refs.

DLC QE575.A43

Pleistocene, Glacier surveys, Glaciation, Landscape development, Russia—Taymyr Peninsula, Russia—Severnaya Zemlya

53-5301

Experience of inventory of surging glaciers of the Pamirs. [Opyt katalogizatsii pul'sirulushchikh lednikov Pamira]

Osipova, G.B., Tsvetkov, D.G., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.223-232, In Russian with English summary. 20 refs.

DLC QE575.A43

Glacier surges, Glacier surveys, Classifications, Mountain glaciers, Spaceborne photography, Pamirs, CIS—Central Asia

53-5302

Geophysical and paleoclimatic implications of the stacked temperature profile from the deep borehole at Vostok station (Antarctica).

Salamatina, A.N., Vostretsov, R.N., Petit, J.R., Lipencov, V.I.A., Barkov, N.I., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.233-240, In English and Russian. 11 refs.

DLC QE575.A43

Paleoclimatology, Geophysical surveys, Boreholes, Ice cores, Ice cover thickness, Ice dating, Ice sheets, Heat flux, Isotope analysis, Antarctica—Vostok Station

53-5303

Glaciological Symposium in Dubna in May, 1998. [Glatsiologicheskii simpozium v Dubne v mae 1998 goda]

Glazovskii, A.F., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.241-246, In Russian.

DLC QE575.A43

Glaciology, Meetings, International cooperation

53-5304

Subglacial lake in the area of the Vostok station (Antarctica) as a subject of complex investigations at the end of XX-beginning of XXI centuries: review of the International meeting in St. Petersburg, March 24-26, 1998. [Podlednoe ozero v rafone stantsii Vostok (Antarktida) kak ob'ekt kompleksnykh issledovaniï v kontse XX-nachale XXI vekov: obzor mezhdunarodnogo soveshchaniia v Sankt-Peterburge, 24-26 marta 1998 g.]

Verkulich, S.R., Danilov, A.I., Kotliakov, V.M., Lukin, V.V., *Rossiiskaia akademiia nauk. Institut geografii. Materialy glatsiologicheskikh issledovaniï*, June 1998, No.85, p.247-250, In Russian. 4 refs.

DLC QE575.A43

Glacial lakes, Subglacial observations, Meetings, International cooperation, Antarctica—Vostok Station